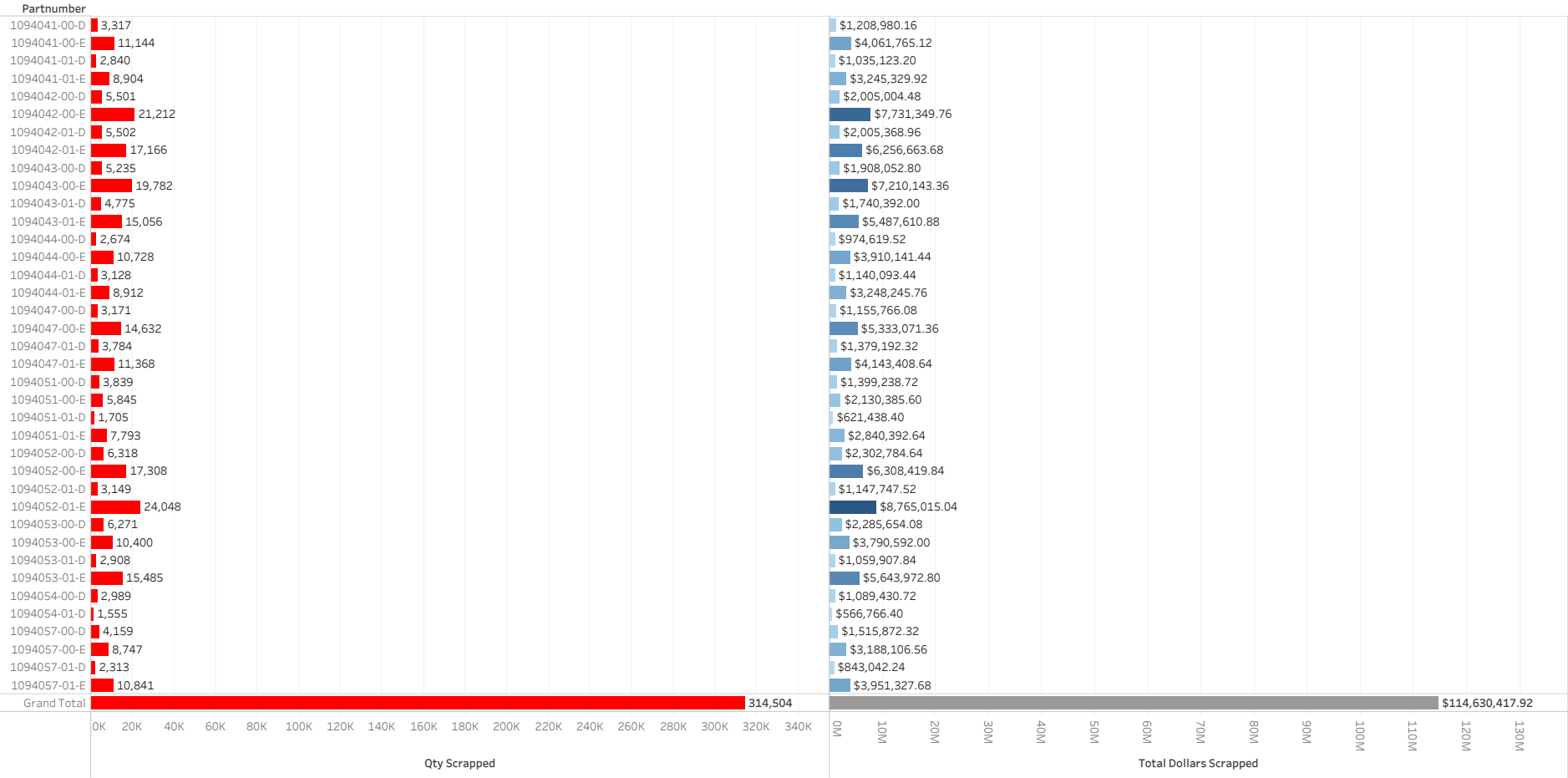


EXHIBIT A

Tesla, Inc. Internal Documents

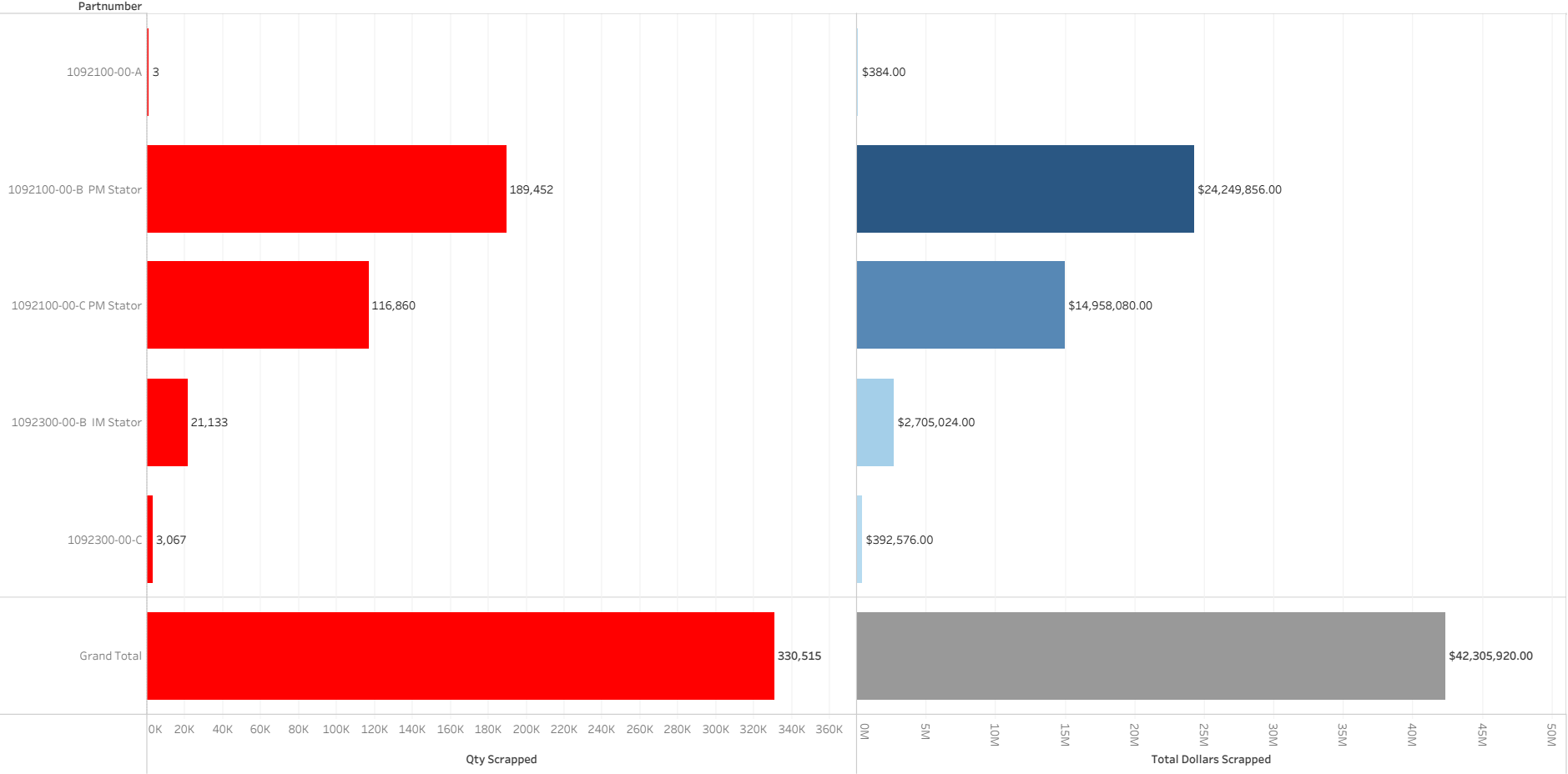
Bandolier Scrap for 2018

Day of ThingModifiedPST
January 1, 2018 to December 31, 2018



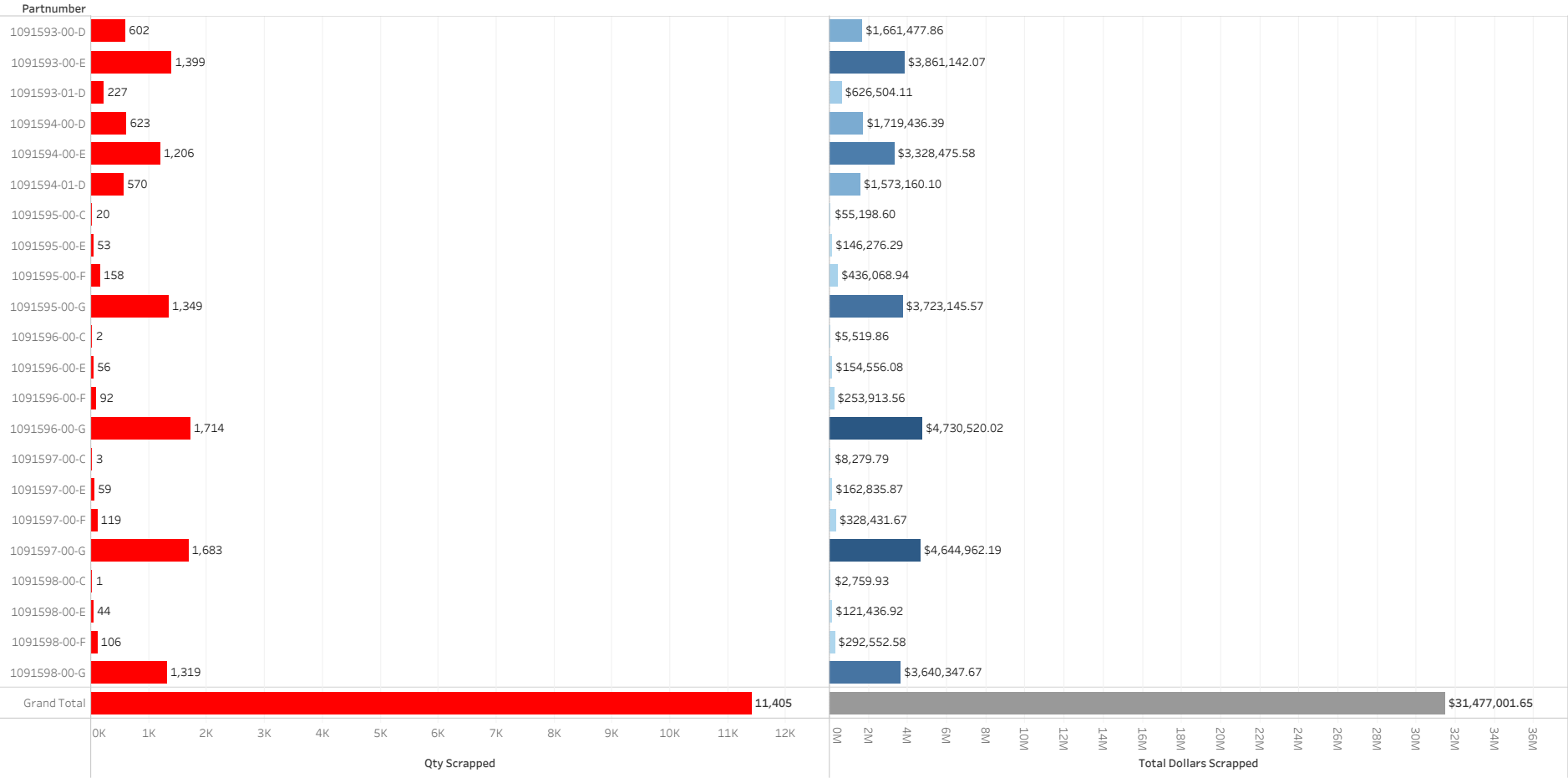
Stator Scrap for 2018

Day of ThingModifiedPST
January 1, 2018 to December 31, 2018



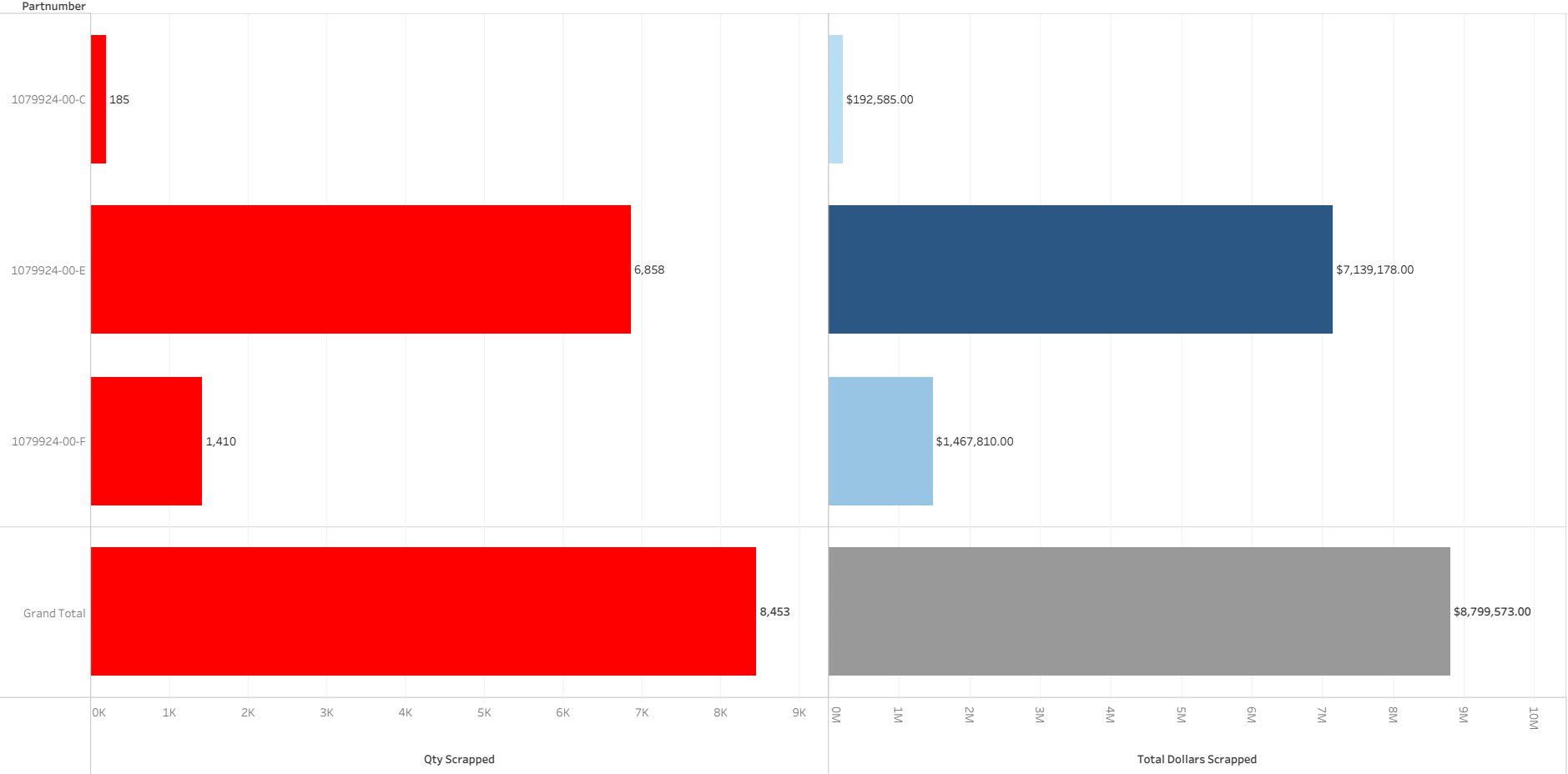
Module Scrap for 2018

Day of ThingModifiedPST
January 1, 2018 to December 31, 2018



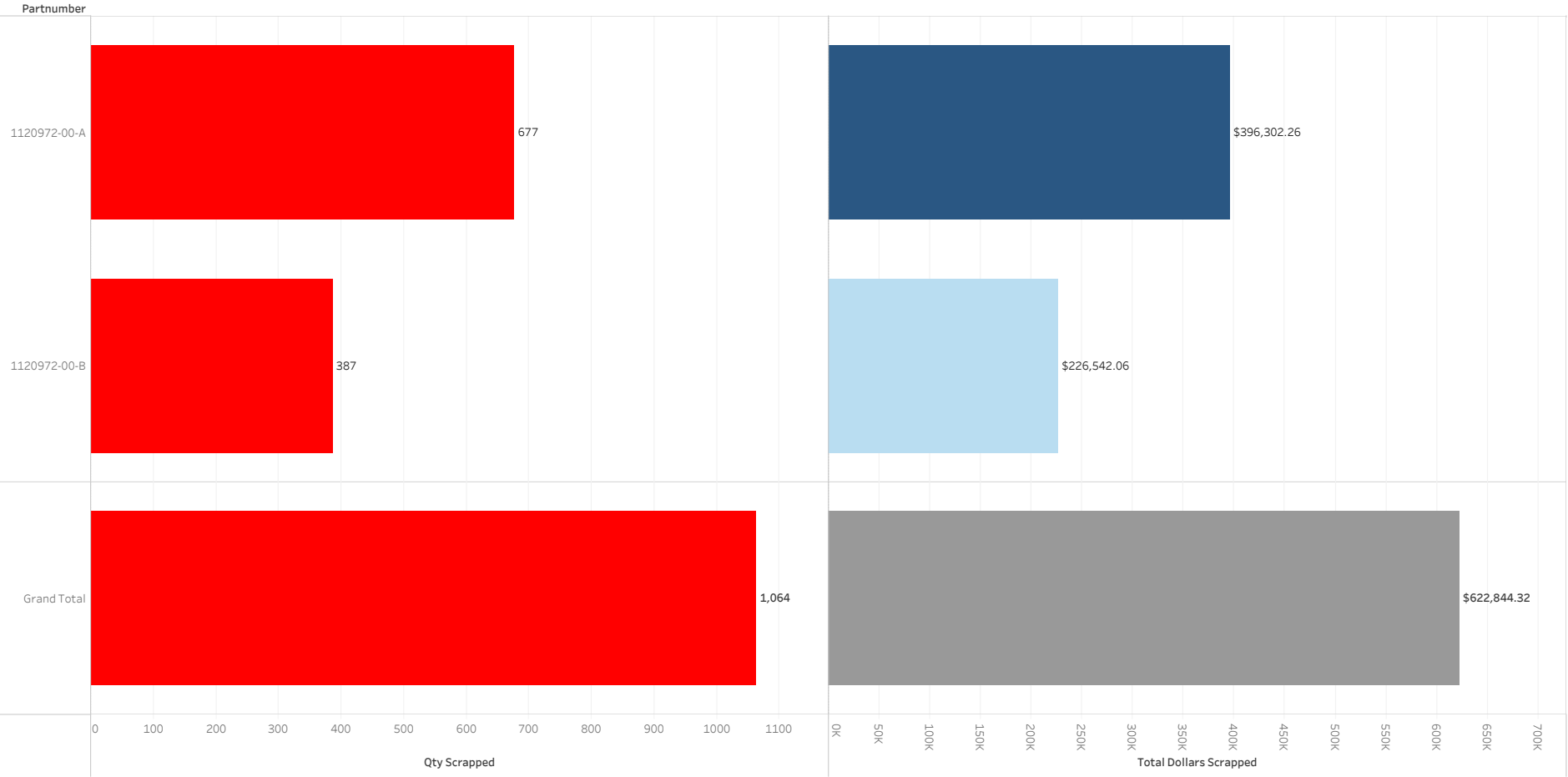
Inverter Scrap for 2018

Day of ThingModifiedPST
January 1, 2018 to December 31, 2018



Drive Unit Scrap for 2018

Day of ThingModifiedPST
January 1, 2018 to December 31, 2018



From: Andre Gava
Sent: Monday, February 12, 2018 6:40 AM
To: Liv Adams; Courtney Grow; Bruce Watson
Subject: Fwd: Damaged Cell Containment #622 Summary
Attachments: Containment_AR0000000622.xlsx

Still need to sync with the crew that spent the night there to find out if the point of start for this containment is correct, to confirm if we found the last known good module.

Sent from my Mobile

----- Original message -----

From: Vladislav Khlyzov <vkhlyzov@tesla.com>
Date: 2/12/18 5:23 AM (GMT-08:00)
To: M3 Module Line Quality Team <m3modulelinequalityteam@TeslaMotorsInc.onmicrosoft.com>, M3 Config Line Quality Team <m3configlinequalityteam@TeslaMotorsInc.onmicrosoft.com>
Cc: Janela Montoya <jamontoya@tesla.com>, Pulkit Agrawal <pagrawal@tesla.com>
Subject: Damaged Cell Containment #622 Summary

Hello Team,

This is regarding the new large containment #622: Punctured/Dented cells on NIC side, located at the thermister corner windows. (Data Spreadsheet attached)



Currently the containment has 1143 modules on HOLD, and we are continuing to try to narrow down the suspect window.

The Config Pick and Place robot was found with an *unscrewed* 'locating pin' that was extending past the maximum tolerance. This resulted in forcing the pin to contact/dent/puncture the cells and/or clamshells.

- The pin was re-seated to normal position and the clean point was then established at **8:45PM (2.11.18)**

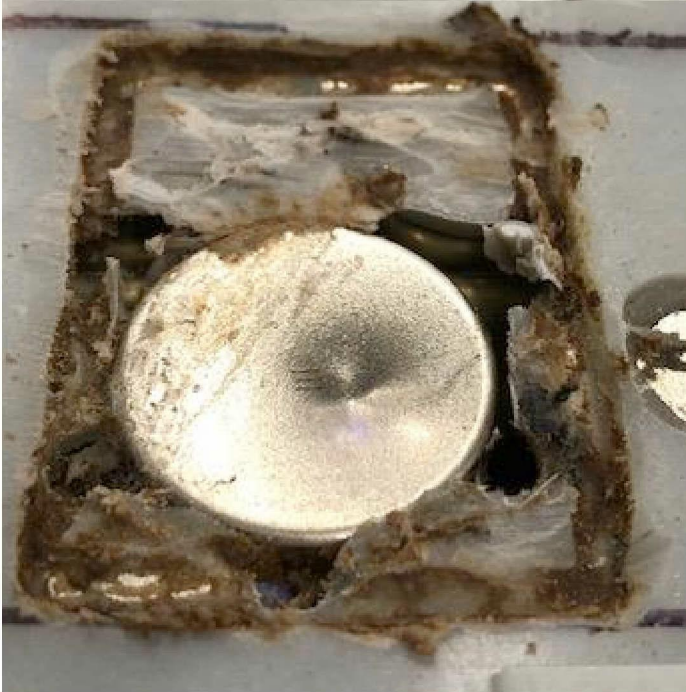


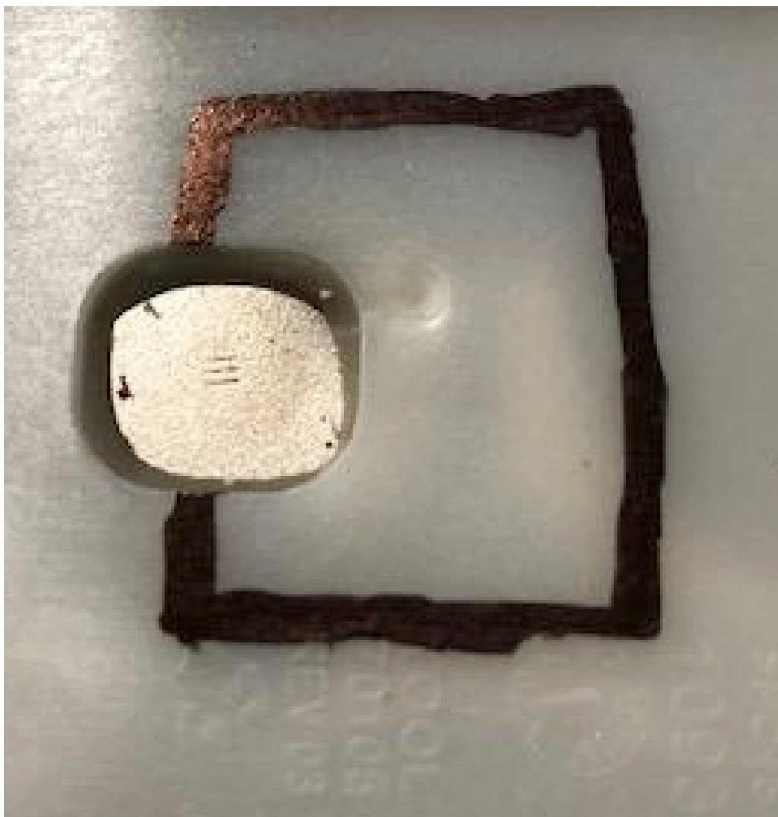
Due to such a high volume of failures, one of the biggest concerns is **storage space and method of storage**. The other concern is if these modules are deemed **re-workable or not**.

- Rework could consist of carefully isolating and capping the dented cell from the module. This would require potting removal near other bonds, that could get damaged during the rework process
- If the dent is under the BMB, it is thought to be able to relocate the BMB to the other end of the Module and then isolate and cap the cell. (If not a POTTED Module) The current collector end branches and the terminal bars would need to be removed and replaced. This would take a lot of rework and leaves a large margin for further defects.
- Modules that have dented cells under the BMB and are potted, there would be too much rework involved to benefit the cost in my opinion.

A decision was made to reject all types of dents on the clamshell due to high probability that the cell underneath is also dented. A few samples were taken to confirm this theory (See Below)

- If a dent on the clamshell is near the edge of the Thermister Window, it was approved to "shave" away, with wooden tip, some clamshell material until you can verify that the cell is NOT dented where the pin hole was previously showing.





This containment is one of our largest yet, with **high** impact on other lines and processes, and it will be a long lasting clean up, so all the help we can get would be greatly appreciated.

Please kindly forward this to anyone that needs to see it so we can all be on the same page quickly to make the most effective responses.

From: Scott Kohn
Sent: Monday, February 19, 2018 12:57 AM
To: Ken Zemach
Cc: Drew Baglino; Jens Peter Clausen
Subject: Re: Adhesive Sealing Tests /// was RE: Punctured Cell Discussion

We've seen liquid present for days and days after puncture of actual incident modules in NIC up configuration. Work is ongoing for determining liquid electrolyte on BMB interaction as modules are flipped and the paste TIM displaces the liquid and orange tinged fluid has been observed. I'm not optimistic.

In any case, if i had to speculate I'd say roughly 150 modules might have punctures under the BMB, maybe 20 are actually punctured. The numbers are similar for not under BMB locations but these are directly observable so they are less problematic.

Thank you,
Scott

On Feb 18, 2018, at 8:58 PM, Ken Zemach <kzemach@tesla.com> wrote:

Shipping unsealed hazmat. Yeah, I know, it's only a measly 3-5ml inside a sealed battery pack, but that pack doesn't technically count as an approved hazmat shipping container.

It's a 'letter of the law' thing. I'm not saying it makes sense in this case, but we would still technically be in violation.

Now if we do a 'best effort' to encapsulate, that might give us legal breathing room.

From: Drew Baglino
Sent: Sunday, February 18, 2018 8:55:08 PM
To: Ken Zemach; Jens Peter Clausen; Scott Kohn
Subject: RE: Adhesive Sealing Tests /// was RE: Punctured Cell Discussion

What's the federal fine about?

From: Ken Zemach
Sent: Sunday, February 18, 2018 8:54 PM
To: Drew Baglino <drew@tesla.com>; Jens Peter Clausen <jpc@tesla.com>; Scott Kohn <scott@tesla.com>
Cc: Andre Gava <agava@tesla.com>; Pedro Padilla <pepadilla@tesla.com>; Vitor Ayres <vayres@tesla.com>; Bruce Watson <bruwatson@tesla.com>; Dov Nitzan <dnitzan@tesla.com>; Ben Zabik <bzabik@tesla.com>; Mikhail Kisilitsyn <MKisilitsyn@tesla.com>; Ryan Hoos <ryhoos@tesla.com>; Kyle Duquette <kduquette@tesla.com>; Dan Burke <danburke@tesla.com>; Chris Guenther <cguenther@tesla.com>
Subject: Re: Adhesive Sealing Tests /// was RE: Punctured Cell Discussion

Knowing they're unsealed is a minimum federal fine of \$77k per instance.

If we try to seal with some strategy that may or may not work, I'm not sure if there are regulatory repercussions.

What will technically happen inside the pack with maybe only 3-5ml of electrolyte is however the question I think you're asking. Using one of the packs and, say, puncturing a second cell as well and doing an endurance/HTHE test would probably give us a decent answer. Scott? Any additional safety concerns?

From: Drew Baglino

Sent: Sunday, February 18, 2018 8:46:59 PM

To: Jens Peter Clausen; Scott Kohn

Cc: Ken Zemach; Andre Gava; Pedro Padilla; Vitor Ayres; Bruce Watson; Dov Nitzan; Ben Zabik; Mikhail Kislitsyn; Ryan Hoos; Kyle Duquette; Dan Burke; Chris Guenther

Subject: RE: Adhesive Sealing Tests /// was RE: Punctured Cell Discussion

Given the orientation of the cells in the pack is favorable what are the risks with shipping unsealed?

Drew

From: Jens Peter Clausen

Sent: Sunday, February 18, 2018 10:05 AM

To: Scott Kohn <scott@tesla.com>

Cc: Ken Zemach <kzemach@tesla.com>; Andre Gava <agava@tesla.com>; Pedro Padilla <pepadilla@tesla.com>; Vitor Ayres <vayres@tesla.com>; Bruce Watson <bruwatson@tesla.com>; Dov Nitzan <dnitzan@tesla.com>; Ben Zabik <bzabik@tesla.com>; Mikhail Kislitsyn <MKislitsyn@tesla.com>; Ryan Hoos <ryhoos@tesla.com>; Kyle Duquette <kduquette@tesla.com>; Drew Baglino <drew@tesla.com>; Dan Burke <danburke@tesla.com>; Chris Guenther <cguenther@tesla.com>

Subject: RE: Adhesive Sealing Tests /// was RE: Punctured Cell Discussion

Look forward to Monday evening when we are able to estimate how many of the dents are true puncture – if not significant then we should consider to scrap.

JPC

From: Scott Kohn

Sent: Sunday, February 18, 2018 9:16 AM

To: Jens Peter Clausen <jpc@tesla.com>

Cc: Ken Zemach <kzemach@tesla.com>; Andre Gava <agava@tesla.com>; Pedro Padilla <pepadilla@tesla.com>; Vitor Ayres <vayres@tesla.com>; Bruce Watson <bruwatson@tesla.com>; Dov Nitzan <dnitzan@tesla.com>; Ben Zabik <bzabik@tesla.com>; Mikhail Kislitsyn <MKislitsyn@tesla.com>; Ryan Hoos <ryhoos@tesla.com>; Kyle Duquette <kduquette@tesla.com>; Drew Baglino <drew@tesla.com>; Dan Burke <danburke@tesla.com>; Chris Guenther <cguenther@tesla.com>

Subject: Re: Adhesive Sealing Tests /// was RE: Punctured Cell Discussion

The team tried that and it was not very effective. They still observed significant mass loss after vacuum process when left in an oven for hours. The small pores in the materials in the cell make liquid extraction slow even under vacuum.

Scott

On Feb 18, 2018, at 8:17 AM, Jens Peter Clausen <jpc@tesla.com> wrote:

Can we create a vacuum and try to remove all liquids inside the cell and then right after glue?

JPC

From: Scott Kohn

Sent: Saturday, February 17, 2018 6:32 PM

To: Ken Zemach <kzemach@tesla.com>

Cc: Andre Gava <agava@tesla.com>; Pedro Padilla <pepadilla@tesla.com>; Jens Peter Clausen <jpc@tesla.com>; Vitor Ayres <vayres@tesla.com>; Bruce Watson <bruwatson@tesla.com>; Dov Nitzan <dnitzan@tesla.com>; Ben Zabik <bzabik@tesla.com>; Mikhail Kislitsyn <MKislitsyn@tesla.com>; Ryan Hoos <ryhoos@tesla.com>; Kyle Duquette <kduquette@tesla.com>; Drew Baglino <drew@tesla.com>; Dan Burke <danburke@tesla.com>; Chris Guenther <cguenther@tesla.com>

Subject: Re: Adhesive Sealing Tests /// was RE: Punctured Cell Discussion

Thanks for the update Ken. As we continue to gather damage depth data and puncture threshold information we will be able to better estimate the population with punctures.

Scott

On Feb 17, 2018, at 5:09 PM, Ken Zemach <kzemach@tesla.com> wrote:

Update on Adhesive Sealing:

Both Torr Seal epoxy and the UV cure adhesive (Dymax 3013) were a bust.

- ? Torr Seal: two out of three cells formed visible bubbles with thin walls before it could cure (1-2 hour cure). These were cells which had been punctured and allowed to outgas for 48 hours prior to sealing attempts.
- ? Dymax 3013: one out of three cells had a bubble leak out the side which subsequently oozed electrolyte. The other two appear OK; doing some additional tests.

Scott has noted that they've been able to use Torr Seal previously with thermocouples inserted in cells and get an adequate seal. We're not entirely sure what the difference is in this case, but the following are possibilities:

- A. These cells are "more fresh" and thus are just off-gassing more, and for a longer period of time.
- B. When wiping the electrolyte off the cells prior to adhesive application (using IPA wipes), some minute amount of IPA is getting into the cell and reacting/off-gassing.

Regardless, to date every adhesive tried has been unsuccessful in assuring us a reliable seal. I'm going to try a few more things with UV tomorrow, but as it stands my prior assertion still stands:

"To date we do not have a way to seal cells with a high degree (or really any degree) of confidence."

<image003.png>

From: Ken Zemach
Sent: Wednesday, February 14, 2018 1:11 PM
To: Andre Gava; Scott Kohn; Pedro Padilla; Jens Peter Clausen
Cc: Vitor Ayres; Bruce Watson; Dov Nitzan; Ben Zabik; Mikhail Kislitsyn; Ryan Hoos; Kyle Duquette; Drew Baglino; Bruce Watson; Dan Burke; Chris Guenther
Subject: RE: Adhesive Sealing Tests /// was RE: Punctured Cell Discussion

This problem is not one of material compatibility. This problem is that within the cure time of the adhesive, outgassing from the cell creates a hole/pinhole. We had one full hole (see image) and one ALMOST hole. Thus, even if we were to find a good compatible adhesive, you need to find something that can cure fast enough. Thus, my desire to try the UV cure. The compatibility issues is completely different. Before we tackle that, let's find out how well the UV does with electrolyte.

<image006.png>

I am additionally worried about the surface prep (ESPECIALLY if TIM has been smeared all over this thing). Let's say we have crappy cell surface cleanliness but fast cure; then the pressure is going to push through the interface during that "mid-cure" point, and you'll never know it. Don't forget about our YEARS of data on bonding strength vs. cell surface cleanliness. It needs to be clean.

You also need sufficient surface area to create a decent bond, and this means we're going to have to dremel around these things, scrape off the 5106, clean off residual material (How??? Still thinking about that), and come up with a sealing method which we have yet to do.

All of this culminates as my statement of "To date we do not have a way to seal cells with a high degree (or really any degree) of confidence." It doesn't mean I'm giving up, just that we have to try something totally different. UV cure is going to be the next trial.

From: Andre Gava
Sent: Wednesday, February 14, 2018 12:47 PM
To: Ken Zemach; Scott Kohn; Pedro Padilla; Jens Peter Clausen
Cc: Vitor Ayres; Bruce Watson; Dov Nitzan; Ben Zabik; Mikhail Kislitsyn;

Ryan Hoos; Kyle Duquette; Drew Baglino; Bruce Watson; Dan Burke;
Chris Guenther
Subject: RE: Adhesive Sealing Tests /// was RE: Punctured Cell
Discussion

Have you considered to use a two layer process. (idea sounds dumb but could work)

Small bead over the puncture of an adhesive that doesn't get attacked by the electrolyte, it keeps electrolyte there, after cured, a second layer of an adhesive known to hold well in nickel plated surface, (3414, TC-2002,7545), this one would hold the "cork in the hole".

From: Ken Zemach
Sent: Wednesday, February 14, 2018 12:19 PM
To: Scott Kohn <scott@tesla.com>; Pedro Padilla <pepadilla@tesla.com>; Jens Peter Clausen <jpc@tesla.com>
Cc: Vitor Ayres <vayres@tesla.com>; Bruce Watson <bruwatson@tesla.com>; Andre Gava <agava@tesla.com>; Dov Nitzan <dnitzan@tesla.com>; Ben Zabik <bzabik@tesla.com>; Mikhail Kislitsyn <MKislitsyn@tesla.com>; Ryan Hoos <ryhoos@tesla.com>; Kyle Duquette <kduquette@tesla.com>; Drew Baglino <drew@tesla.com>; Bruce Watson <bruwatson@tesla.com>; Dan Burke <danburke@tesla.com>; Chris Guenther <cguenther@tesla.com>
Subject: RE: Adhesive Sealing Tests /// was RE: Punctured Cell Discussion

[Reduced distribution.]

BLUF (Bottom Line Up Front): To date we do not have a way to seal cells with a high degree (or really any degree) of confidence. Please do not plan on reworking modules with punctured cells sealed with adhesives for now. Current evidence is not supporting this methodology.

More details:

- Tested to date: 3414, TC-2002, 7545
 - A. All of the adhesives swell in electrolyte, indicating performance will be decreased.
 - B. Lap shear strength decreased appreciably for all tested samples
 - C. Adhesives applied to drilled cells which were allowed to sit and "bleed out to equilibrium" for 24 hours either failed subsequent sealing or showed that seal failure was a distinct possibility.
- Using a high vacuum pump to remove electrolyte from cells, even when the high vacuum seal is applied for 7 minutes, still leaves an appreciable amount of electrolyte in the cell. Thus removal of existing electrolyte is not possible with this method.

Due to evidence from test C above, I am not confident in any two part curing adhesive being able to reliably seal cells especially in a non-temperature controlled, non-optimized surface preparation environment. I would, however, like to try the UV cure adhesive we use on the Model S/X line. It may be that we can snap cure it fast enough to avoid the pinhole/hole formation issues we saw on our current samples. Can't say it'll hold, but we might be able to get an initial seal which is a start.

From: Ken Zemach

Sent: Tuesday, February 13, 2018 9:37 AM

To: Scott Kohn; Pedro Padilla; Chris Guenther

Cc: Robert Wilkerson; Jens Peter Clausen; Vitor Ayres; Bruce Watson; Andre Gava; Andrew Ross; Robert Scheffler; Sanket Bhanage; Victor Prajapati; Victoria Indaco; Mina Fouad; Nicholas Jansen; Shawne Beaulac; Shino Xu; Brandon Snyder; Chirag Shah; Dan Burke; Dov Nitzan; Ben Zabik; Mikhail Kislitsyn; Ryan Hoos; Kyle Duquette; Drew Baglino

Subject: Adhesive Sealing Tests /// was RE: Punctured Cell Discussion

Thanks Scott.

Some should be in tomorrow, but that'll be too late to do any testing by the time these have to be processed. We'll still run it through the same set of testing we're using for the other test candidates (TC-2002, 3414, and 7545; each chosen for a particular set of characteristics) just because.

We have four 'tests' underway:

1. Swelling test: lines of each of the three adhesives has been soaked overnight, and we'll measure the weight gain to get an idea of how much each will swell in electrolyte. That'll tell us something about how easily electrolyte exposure from inside the cell might swell and subsequently delaminate the adhesive from the cell surface. Lots of guessing on this one though; no conclusions can be drawn.
2. Lap shear tests: six each lap shear samples on Ni plated steel set up; three in electrolyte, three exemplars. We'll compare loss in properties, if any. To be honest, T-peel would be a better test IMO but we don't have the time or the containers to do that right, so we went with lap shear.
3. Punctured cell sealing tests: Individual cell(s) were drilled through on the bottom to the point electrolyte bubbles out. Those were left in the hood overnight. Today we'll wipe off the electrolyte with IPA, 'seal' with each of the adhesive candidates, let cure, weigh, then put in the oven at 60C for several hours, weigh again, and see if we can detect any weight loss (via electrolyte emissions). Not as good of a tests as it sounds because we're low on both duration and cyclic fatigue which a cell will experience every day with charge/discharge.

4. Cell can puncture sealing test. This would be my favorite, but we don't have time to do it right. A) drill a hole in the bottom of an empty can. B) seal the hole with a glob of adhesive C) flip the can over, fill with electrolyte, and let sit overnight (this much is done now). D) wash out can with IPA, fill with dyed water, attach to pressure cycle tester, and cycle from atmospheric pressure (P0) to P=P1, where we calculate P1 using ideal gas law assuming the average void volume in a cell plus 1cm³ for missing electrolyte at a dT of 20C (20C to 40C, assuming the cell will not reach as high a temp as surrounding cells). We have a standard cycle rate, which is two cycles/hour (need to hold to have reasonable ramp up/down). Thus to simulate 10 years we need about 75-150 days of testing. The lack of electrolyte in the cell during testing is admittedly a shortcoming, but I just can't buy off on pressurized electrolyte in a cycling system with an intentional defect.

From: Scott Kohn

Sent: Monday, February 12, 2018 4:51 PM

To: Pedro Padilla; Chris Guenther

Cc: Robert Wilkerson; Jens Peter Clausen; Vitor Ayres; Bruce Watson; Andre Gava; Andrew Ross; Robert Scheffler; Sanket Bhanage; Victor Prajapati; Victoria Indaco; Mina Fouad; Nicholas Jansen; Shawne Beaulac; Ken Zemach; Shino Xu; Brandon Snyder; Chirag Shah

Subject: RE: Punctured Cell Discussion

This two part epoxy is the best thing I'm aware of for this application.

http://www.idealvac.com/files/brochures/Torr_Seal2.pdf

Thanks,
Scott

Scott Kohn | Sr. Manager | Battery Safety and R&D

3500 Deer Creek Road | Palo Alto, CA 94304

p 650.681.5295 | e scott@tesla.com

<image007.gif>

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<image008.png> <image009.png> <image010.png>

Please consider the environment before printing this email.

From: Pedro Padilla

Sent: Monday, February 12, 2018 1:02 PM

To: Chris Guenther <cguenther@tesla.com>

Cc: Robert Wilkerson <rwilkerson@tesla.com>; Jens Peter Clausen <jpc@tesla.com>; Vitor Ayres <vayres@tesla.com>; Bruce Watson <bruwatson@tesla.com>; Andre Gava <agava@tesla.com>; Andrew Ross <andross@tesla.com>; Robert Scheffler <rscheffler@tesla.com>; Sanket Bhanage <sbhanage@tesla.com>; Victor Prajapati

<vpriajapati@tesla.com>; Victoria Indaco <vindaco@tesla.com>; Mina Fouad <mfouad@tesla.com>; Nicholas Jansen <njansen@tesla.com>; Shawne Beaulac <sbeaulac@tesla.com>; Ken Zemach <kzemach@tesla.com>; Shino Xu <nuxu@tesla.com>; Brandon Snyder <brasnyder@tesla.com>; Chirag Shah <cschah@tesla.com>; Scott Kohn <scott@tesla.com>

Subject: Re: Punctured Cell Discussion

+Scott

Sent from my iPhone

On Feb 12, 2018, at 10:03 AM, Chris Guenther <cguenther@tesla.com> wrote:

Status Update:

Contained Modules:

CONSUMED	372
MMS	473
WIP	200
Grand Total	1045

<https://spargf1.teslamotors.com/quality/containment/AR0000000622>

Scenarios:

25S

- Clamshell Dented
- Clamshell Punctured

23S

- No damage based on additional clearance between cell and pin on robot
- Cell Dent
- Non BMB Side
- BMB Side
- No BMB Installed
- BMB Installed
- Potted

Action:

Based on verification of severity of clamshell dent determine when rework is required – Bruce
Review modules to determine timing of cell dent and increase in severity over time – Sanket
Generate list of all 23S with current state to identify which scenario above they fall into - Sanket
Determine firmware effect on capping thermistor window cell – Ken Zemach

Determine laydown space modules placed in enclosures
– Brandon Snyder
Locate addition scrapped enclosures – Brandon Snyder
Determine if pulse testing can be used to identify
change point in cell performance – Chrirag
Determine if we can get production enclosures from
pack off of production pallets and store on the floor –
Shawne
Generate rework process for modules – Robert
Wilkerson
Determine long term solution to recording module
orientation in relation to robot 1 end effector - Victoria

We will meet again this afternoon to review. I will setup
the meeting.

Chris Guenther | Production Engineering Senior
Manager | Gigafactory 1
Electric Ave | Sparks, NV 89434
c 512.769.6654 | e cguenther@tesla.com



<image011.jpg>

-----Original Appointment-----

From: Robert Wilkerson
Sent: Monday, February 12, 2018 8:17 AM
To: Robert Wilkerson; Chris Guenther; Jens Peter
Clausen; Pedro Padilla; Vitor Ayres; Bruce Watson;
Andre Gava; Andrew Ross; Robert Scheffler; Sanket
Bhanage
Cc: Victor Prajapati; Victoria Indaco; Mina Fouad;
Nicholas Jansen; Shawne Beaulac
Subject: Punctured Cell Discussion
When: Monday, February 12, 2018 8:30 AM-9:00 AM
(UTC-08:00) Pacific Time (US & Canada).
Where: Room - Tamarack
Importance: High

Discuss current situation and immediate next steps and
avoid any potential confusion.

Looking for room but can start at 9am meeting location.

Tamarack appears open

Zoom:

<https://tesla.zoom.us/j/4325728402>

From: Scott Smith
Sent: Tuesday, April 10, 2018 7:13 PM
To: Michael Bowling
Subject: FW: Scrap Report 4/2/2018
Attachments: 2018WW14_FinanceScrap.xlsb

From: Shaun Heimlich
Sent: Tuesday, April 10, 2018 7:12:46 PM (UTC-08:00) Pacific Time (US & Canada)
To: Deepak Ahuja; Peter Hochholding; Jens Peter Clausen; Eddie Gates; Justin McAnear; Zachary Kirkhorn; Jerome Guillen; Kevin Kassekert; Andy Hamilton; Gilbert Passin; Josh Tech; Kelsey Abdollahian; Shane Manciangli; Warrick Taylor; Alexandra Kantor; Bonneville Eggleston; Toni Abou-Haydar; Daniel Ho; Bruno Bambaren; Pedro Padilla; GSM_Managers; Gabrielle Bressack; Tarak Makecha; Gaurav Jain; Afton Versteegh; Scott Smith; Ric Caraballo; Shea Anderson; Katherine Beach; Joby Thomas; Katie Trainor; Doug Field; Michael Schwegutsch
Cc: Judy Wu; Amy Li; Jacqueline Meyer; Alex Cillo
Subject: Scrap Report 4/2/2018

Hello All,

Please see below for Week of April 2, 2018 scrap summary based on QTD financials.

- Model S/X, last week's scrap was **\$832/car** (includes Eng/Design), compared to QTD average of **\$832/car**.
 - \$143K – PAINTED BODY, MODEL X
 - \$133K – due to Lathrop test shot aluminum scrap
 - \$103K – ASY, HV BATT, 100KWH,SX
 - \$61K – Due to Cell scrap
- Model 3, last week's scrap was **\$1,920/car**, compared to QTD average of **\$1,920/car**.
 - \$1,828K – due to module scrap
 - \$1,557K – due to Bandolier scrap

Energy Scrap:

- Q2 QTD is **\$169K**
 - \$107K due to modules
 - \$20K due to cold plates
 - \$10k due to pods scrap

Model S/X

Executive Summary & Trend

Last Update [4.10.2018]

Last Update [4.10.2018]	Latest Week			B/W	QTD		C
	Apr-02	Week Target			Q1-2018	QTD Target	
Factory Gate Cars	1,626	0	1,626	1,626	0		
Factory Gate Cars - X	668	-	668	668	0		
Factory Gate Cars - S	958	-	958	958	0		
Scrap (\$K)	\$ 1,353	\$ -	\$ (1,353)	\$ 1,353	\$ -	\$	
Process	1,017			1,017			
Material Quality	245			245			
Engineering	91			91			
Obsolescence (\$K)	\$ -			\$ -			
Obsolescence Transacted	15			15			
Reserves Released	(15)			(15)			
Reserves Taken	0			-			
Vendor Obsolescence	0			-			
Scrap (\$/car)	\$ 832		\$ (832)	\$ 832	#DIV/0!	#D	
Process	626			626			
Material Quality	151			151			
Engineering	56			56			

Top Scrap Areas of the Week & Quarterly Trends

	Week of Apr 02			Grand Total
	Eng/Design	Material Quality	Process	
Battery Module	\$1,252	\$28,717	\$101,879	\$131,849
Battery Pack		\$3,616	\$5,314	\$8,931
Body in White		\$1,842	\$6,160	\$8,002
Electrics	\$5,223	\$10	\$7,479	\$12,712
End of Line			\$55,519	\$55,519
General Assembly	\$38,523	\$118,520	\$285,070	\$442,112
Large Drive Unit			\$12,792	\$12,792
Lathrop	\$3,175	\$83,949	\$75,071	\$162,195
Other		\$1,626	\$14,408	\$16,034
Paint		\$1,618	\$137,720	\$139,338
Plastics			\$1,476	\$1,476
Seat Manufacturing			\$7,594	\$7,594
Small Drive Unit	\$5,734	\$589	\$71,262	\$77,585
Stamping			\$9	\$9

Model 3

Executive Summary & Trend

Last Update [4.10.2018]	Latest Week Apr-02	Week Target	B/W	QTD Q1-2018	QTD Target
Factory Gate Cars	2,049	0	2,049	2,049	0
Scrap (\$K)	\$ 3,933	\$ -	\$ (3,933)	\$ 3,933	\$ -
Process	3,933			3,933	
Material Quality	-				
Engineering	-				
Obsolescence (\$K)	\$ -				
Obsolescence Transacted	-				
Reserves Released	-				
Reserves Taken					
Vendor Obsolescence					
Scrap (\$/car)	\$ 1,920	\$ -	\$ (1,920)	\$ 1,920	#DIV/0!
Process	1,920			\$ 1,920	
Material Quality	0				
Engineering	0				

Top Scrap Areas of the Week

Row Labels	Sum of Scrap Cost
Module	\$ 3,408,489
HV Battery	\$ 225,470
GA	\$ 145,387
Drive Unit	\$ 114,402
Seats	\$ 25,190
BIW	\$ 9,960
Inverter	\$ 4,303
Grand Total	\$ 3,933,201

From: Scott Smith
Sent: Wednesday, April 11, 2018 7:52 AM
To: Michael Bowling
Subject: FW: Scrap Report 4/2/2018

From: Aron Szecsey
Sent: Wednesday, April 11, 2018 7:52:03 AM (UTC-08:00) Pacific Time (US & Canada)
To: Scott Smith
Subject: RE: Scrap Report 4/2/2018

How is inverter \$4k?

Row Labels	Sum of Scrap Cost
Module	\$ 3,408,489
HV Battery	\$ 225,470
GA	\$ 145,387
Drive Unit	\$ 114,402
Seats	\$ 25,190
BIW	\$ 9,960
Inverter	\$ 4,303
Grand Total	\$ 3,933,201

From: Scott Smith
Sent: Wednesday, April 11, 2018 7:51 AM
To: Shaun Heimlich <sheimlich@tesla.com>
Cc: Aron Szecsey <aszecsey@tesla.com>
Subject: RE: Scrap Report 4/2/2018

Hi Shaun,

Can you include Aron on your weekly report?

Thanks,

Scott

From: Shaun Heimlich
Sent: Tuesday, April 10, 2018 7:13 PM
To: Deepak Ahuja <deepak@tesla.com>; Peter Hochholdinger <phochholdinger@tesla.com>; Jens Peter Clausen <jpc@tesla.com>; Eddie Gates <EGates@tesla.com>; Justin McAnear <jmcanear@tesla.com>; Zachary Kirkhorn <ZKirkhorn@tesla.com>; Jerome Guillen <jerome@tesla.com>; Kevin Kassekert <kkassekert@tesla.com>; Andy Hamilton <ahamilton@tesla.com>; Gilbert Passin <gpassin@tesla.com>; Josh Tech <jtech@tesla.com>; Kelsey Abdollahian <kabdollahian@tesla.com>; Shane Manciangli <smanciangli@tesla.com>; Warrick Taylor <wtaylor@tesla.com>; Alexandra Kantor <akantor@tesla.com>; Bonneville Eggleston <beggleston@tesla.com>; Toni Abou-Haydar <toni@tesla.com>; Daniel Ho <DanHo@tesla.com>; Bruno Bambaren <bbambaren@tesla.com>; Pedro Padilla <pepadilla@tesla.com>; GSM_Managers <GSM_Managers@tesla.com>; Gabrielle Bressack <gbressack@tesla.com>; Tarak Makecha

<tmakecha@tesla.com>; Gaurav Jain <gjain@tesla.com>; Afton Versteegh <aversteegh@tesla.com>; Scott Smith <scosmith@tesla.com>; Ric Caraballo <rcaraballo@tesla.com>; Shea Anderson <shanderson@tesla.com>; Katherine Beach <kbeach@tesla.com>; Joby Thomas <jethomas@tesla.com>; Katie Trainor <ktrainor@tesla.com>; Doug Field <DField@tesla.com>; Michael Schwegkutsch <michael@tesla.com>
Cc: Judy Wu <judy@tesla.com>; Amy Li <amli@tesla.com>; Jacqueline Meyer <jacmeyer@tesla.com>; Alex Cillo <acillo@tesla.com>

Subject: Scrap Report 4/2/2018

Hello All,

Please see below for Week of April 2, 2018 scrap summary based on QTD financials.

- Model S/X, last week's scrap was **\$832/car** (includes Eng/Design), compared to QTD average of **\$832/car**.
 - \$143K – PAINTED BODY, MODEL X
 - \$133K – due to Lathrop test shot aluminum scrap
 - \$103K – ASY, HV BATT, 100KWH,SX
 - \$61K – Due to Cell scrap
- Model 3, last week's scrap was **\$1,920/car**, compared to QTD average of **\$1,920/car**.
 - \$1,828K – due to module scrap
 - \$1,557K – due to Bandolier scrap

Energy Scrap:

- Q2 QTD is **\$169K**
 - \$107K due to modules
 - \$20K due to cold plates
 - \$10k due to pods scrap

Model S/X

Executive Summary & Trend

Last Update [4.10.2018]

Last Update [4.10.2018]	Latest Week			Week Target	B/W	QTD		C
	Apr-02					Q1-2018	QTD Target	
Factory Gate Cars		1,626		0	1,626		1,626	0
Factory Gate Cars - X		668		-	668		668	0
Factory Gate Cars - S		958		-	958		958	0
Scrap (\$K)	\$	1,353	\$	-	\$ (1,353)	\$	1,353	\$ -
Process		1,017					1,017	
Material Quality		245					245	
Engineering		91					91	
Obsolescence (\$K)	\$	-				\$	-	
Obsolescence Transacted		15					15	
Reserves Released		(15)					(15)	
Reserves Taken		0					-	
Vendor Obsolescence		0					-	
Scrap (\$/car)	\$	832			\$ (832)	\$	832	#DIV/0!
Process		626					626	
Material Quality		151					151	
Engineering		56					56	

Top Scrap Areas of the Week & Quarterly Trends

	Week of Apr 02			Grand Total
	Eng/Design	Material Quality	Process	
Battery Module	\$1,252	\$28,717	\$101,879	\$131,849
Battery Pack		\$3,616	\$5,314	\$8,931
Body in White		\$1,842	\$6,160	\$8,002
Electrics	\$5,223	\$10	\$7,479	\$12,712
End of Line			\$55,519	\$55,519
General Assembly	\$38,523	\$118,520	\$285,070	\$442,112
Large Drive Unit			\$12,792	\$12,792
Lathrop	\$3,175	\$83,949	\$75,071	\$162,195
Other		\$1,626	\$14,408	\$16,034
Paint		\$1,618	\$137,720	\$139,338
Plastics			\$1,476	\$1,476
Seat Manufacturing			\$7,594	\$7,594
Small Drive Unit	\$5,734	\$589	\$71,262	\$77,585
Stamping			\$9	\$9

Model 3

Executive Summary & Trend

Last Update [4.10.2018]	Latest Week Apr-02	Week Target	B/W	QTD Q1-2018	QTD Target
Factory Gate Cars	2,049	0	2,049	2,049	0
Scrap (\$K)	\$ 3,933	\$ -	\$ (3,933)	\$ 3,933	\$ -
Process	3,933			3,933	
Material Quality	-				
Engineering	-				
Obsolescence (\$K)	\$ -				
Obsolescence Transacted	-				
Reserves Released	-				
Reserves Taken					
Vendor Obsolescence					
Scrap (\$/car)	\$ 1,920	\$ -	\$ (1,920)	\$ 1,920	#DIV/0!
Process	1,920			\$ 1,920	
Material Quality	0				
Engineering	0				

Top Scrap Areas of the Week

Row Labels	Sum of Scrap Cost
Module	\$ 3,408,489
HV Battery	\$ 225,470
GA	\$ 145,387
Drive Unit	\$ 114,402
Seats	\$ 25,190
BIW	\$ 9,960
Inverter	\$ 4,303
Grand Total	\$ 3,933,201

From: Alexis Ramponi
Sent: Tuesday, April 17, 2018 4:32 PM
To: Eric Morrison
Subject: RE: Q1 Cycle Count Status update

Hi Eric,

Below few questions I thought we could ask to better understand the process.

Challenges and thoughts are welcome!

Thanks,
Alex

- Are written physical or cycle count procedures in existence and documented?
- Do written physical/cycle inventory procedures include all specific inventory locations to be counted?
- Do cycle counter responsibilities and cycle counting program procedures include objectives of the program (part stratification, coverage, cut-off measures, etc.)?
- Do written physical/cycle inventory procedures include specific responsibilities of counters, supervisors, coordinators, cost accounting, information systems and management?
- Do physical/cycle inventory procedures include controls for ensuring an accurate cutoff of inventory receipts and issuances and provision for controlling movement of inventory items until counts are completed and validated?
- Do physical/cycle inventory procedures include controls to ensure "blind counts" are in place (i.e., counters are unaware of quantities per the system)?
- Do physical/cyclical inventory procedures include required test counts to be performed by an individual independent of the original count?
- Do physical inventory/cycle count procedures include established quantity or value thresholds where differences between the physical count and perpetual balances must be investigated and documented?
- Do physical inventory/cycle count procedures include documentation and approval requirements for adjustments to perpetual inventory balances?
- Do physical inventory/cycle count procedures include required formats for reporting the results of the physical inventory or cycle count program to management?
- Are stocks during physical inventory arranged, marked, labeled, or otherwise described to facilitate an accurate count by the count teams and are stocks not to be counted segregated?
- Is damaged, obsolete, scrap, and consigned inventory clearly identified during physical inventory and segregated to facilitate recognition for accounting purposes?
- Are pre-numbered count tags or sheets used and accounted for following the count (for example, the sequence of serially numbered count documents is checked, and missing and/or duplicate documents are investigated)?
- If applicable + volumes or value is significant, is Tesla owned material located at off-site locations counted and verified at least quarterly?
- Are all inventory areas/items counted at least once per year and is all inventory on consignment, at suppliers, subcontractors or in possession of employees counted or confirmed in writing at least annually?

From: Eric Morrison
Sent: Tuesday, April 17, 2018 2:35 PM

To: Alexis Ramponi <aramponi@tesla.com>

Subject: FW: Q1 Cycle Count Status update

Let's chat about this . . .

Will schedule time with JP.

Eric

From: Swapnil Bhatnagar

Sent: Tuesday, April 17, 2018 13:56

To: Manan Arora <marora@tesla.com>; Eric Morrison <emorrison@tesla.com>

Subject: FW: Q1 Cycle Count Status update

Please review your areas and let's discuss.

Eric – we may need to come up with smart and practical manual controls to keep inventory accurate for energy and G1. The numbers are so low that's it is very concerning.



Swapnil Bhatnagar | Tesla | 45500 Fremont Blvd, Fremont, CA 94538

p 818.530.6884 | e sbhatnagar@tesla.com



The information contained in this message may be privileged and confidential.

From: Judy Phyo

Sent: Tuesday, April 17, 2018 11:16 AM

To: Richard Browning <rbrowning@tesla.com>; Julie Mallory <jumallory@tesla.com>; Michele Migliori <mmigliori@tesla.com>; Brandon Snyder <brasnyder@tesla.com>; Joe Yoon <jyoon@tesla.com>; Craig Emigh <cemigh@tesla.com>

Cc: Deepak Ahuja <deepak@tesla.com>; Judy Wu <judy@tesla.com>; Swapnil Bhatnagar <sbhatnagar@tesla.com>; Amy Li <amli@tesla.com>; Brandon Snyder <brasnyder@tesla.com>; John Partridge <jpartridge@tesla.com>; Andy Hamilton <ahamilton@tesla.com>; Toan Tran <totran@tesla.com>; Isaac Lee <ilee@tesla.com>; Adam Plumpton <aplumpton@tesla.com>; Rebecca Vincent <rvincent@tesla.com>

Subject: Q1 Cycle Count Status update

Hi All,

Please see attached the presentation for our meeting at 1:30pm today.

Regards,

JP

JP (Judy Phyo) | Technical Accounting & SEC Reporting

3500 Deer Creek Road | Palo Alto, CA 94304

p 510.249.8163 | c 510.857.7326 | jphyo@teslamotors.com



From: Alex Gedalin
Sent: Thursday, April 26, 2018 10:07 AM
To: Liv Adams;Scott Smith;John Sheridan;John Paul Jose;David Zhang;Mohammed Damia;Bruce Watson
Cc: Prabhakar Marishetty;Andre Gava;Emily Johnson;Shaun Heimlich;Prasath Ramakrishnan;Daniel Ho;Srikanth Kotipalli;Ashwin Krishnappa Kumar;Mike Muren;Chris Guenther;Michael Bowling
Subject: RE: Module Yield report not working

It looks like we are in agreement on going ahead with the exception tab. That should be done by tomorrow at the latest.

Thanks,
Alex

From: Liv Adams
Sent: Thursday, April 26, 2018 9:45 AM
To: Scott Smith <scosmith@tesla.com>; John Sheridan <jsheridan@tesla.com>; Alex Gedalin <agedalin@tesla.com>; John Paul Jose <jojose@tesla.com>; David Zhang <dazhang@tesla.com>; Mohammed Damia <mdamia@tesla.com>; Bruce Watson <bruwatson@tesla.com>
Cc: Prabhakar Marishetty <pmarishetty@tesla.com>; Andre Gava <agava@tesla.com>; Emily Johnson <emilyjohnson@tesla.com>; Shaun Heimlich <sheimlich@tesla.com>; Prasath Ramakrishnan <pramakrishnan@tesla.com>; Daniel Ho <DanHo@tesla.com>; Srikanth Kotipalli <skotipalli@tesla.com>; Ashwin Krishnappa Kumar <askumar@tesla.com>; Mike Muren <mmuren@tesla.com>; Chris Guenther <cguenther@tesla.com>; Michael Bowling <mbowling@tesla.com>
Subject: RE: Module Yield report not working

Okay – good to know we are aligned on doing things the right way.

Michael, is there someone on your team who can take the lead ensuring NCM is scrapping properly? I can ensure that MRB team is also using the corrects methods.

John – maybe your team can help audit overall?

Thanks, Liv

980-333-1416

From: Scott Smith
Sent: Thursday, April 26, 2018 9:40 AM
To: John Sheridan <jsheridan@tesla.com>; Liv Adams <oladams@tesla.com>; Alex Gedalin <agedalin@tesla.com>; John Paul Jose <jojose@tesla.com>; David Zhang <dazhang@tesla.com>; Mohammed Damia <mdamia@tesla.com>; Bruce Watson <bruwatson@tesla.com>
Cc: Prabhakar Marishetty <pmarishetty@tesla.com>; Andre Gava <agava@tesla.com>; Emily Johnson <emilyjohnson@tesla.com>; Shaun Heimlich <sheimlich@tesla.com>; Prasath Ramakrishnan <pramakrishnan@tesla.com>; Daniel Ho <DanHo@tesla.com>; Srikanth Kotipalli <skotipalli@tesla.com>; Ashwin Krishnappa Kumar <askumar@tesla.com>; Mike Muren <mmuren@tesla.com>; Chris Guenther <cguenther@tesla.com>; Michael Bowling <mbowling@tesla.com>
Subject: RE: Module Yield report not working

Agree it is a short-term fix to correct behavior and the goal should be for it to be zero. But it is still needed to do so.

Thanks,

Scott

From: John Sheridan
Sent: Thursday, April 26, 2018 9:33 AM
To: Liv Adams <oladams@tesla.com>; Scott Smith <scosmith@tesla.com>; Alex Gedalin <agedalin@tesla.com>; John Paul Jose <jojose@tesla.com>; David Zhang <dazhang@tesla.com>; Mohammed Damia <mdamia@tesla.com>; Bruce Watson <bruwatson@tesla.com>

Cc: Prabhakar Marishetty <pmarishetty@tesla.com>; Andre Gava <agava@tesla.com>; Emily Johnson <emilyjohnson@tesla.com>; Shaun Heimlich <sheimlich@tesla.com>; Prasath Ramakrishnan <pramakrishnan@tesla.com>; Daniel Ho <DanHo@tesla.com>; Srikanth Kotipalli <skotipalli@tesla.com>; Ashwin Krishnappa Kumar <askumar@tesla.com>; Mike Muren <mmuren@tesla.com>; Chris Guenther <cguenther@tesla.com>; Michael Bowling <mbowling@tesla.com>
Subject: Re: Module Yield report not working

Hi Liv –

Agree 100%. That is essentially the objective of the “exceptions” tab. Provide visibility so we can address the incorrect usage and drive it to zero.

-John

From: Liv Adams <oladams@tesla.com>
Date: Thursday, April 26, 2018 at 9:26 AM
To: Scott Smith <scosmith@tesla.com>, Alex Gedalin <agedalin@tesla.com>, John Paul Jose <jojose@tesla.com>, David Zhang <dazhang@tesla.com>, Mohammed Damia <mdamia@tesla.com>, Bruce Watson <bruwatson@tesla.com>, John Sheridan <jsheridan@tesla.com>
Cc: Prabhakar Marishetty <pmarishetty@tesla.com>, Andre Gava <agava@tesla.com>, Emily Johnson <emilyjohnson@tesla.com>, Shaun Heimlich <sheimlich@tesla.com>, Prasath Ramakrishnan <pramakrishnan@tesla.com>, Daniel Ho <DanHo@tesla.com>, Srikanth Kotipalli <skotipalli@tesla.com>, Ashwin Krishnappa Kumar <askumar@tesla.com>, Mike Muren <mmuren@tesla.com>, Chris Guenther <cguenther@tesla.com>, Michael Bowling <mbowling@tesla.com>
Subject: RE: Module Yield report not working

Hi Scott –

I am not sure that we would need an exceptions tab as there shouldn’t be any exceptions. We must align on correct methods of doing things in MOS. We should not be using the “thing scrap” API because it does not remove the things from inventory (which of course causes other problems) We need to be using the “approved” method of scrapping everywhere in the factory and we need to ensure all teams that are involved in scrapping products are properly trained on setting up these processes.

Short term we can flag when people are using the old API. Long term we could make the old API point to the new one.

Thanks, Liv

Liv Adams | Quality Systems Engineer
980.333.1416 | oladams@tesla.com

From: Scott Smith
Sent: Thursday, April 26, 2018 8:19 AM
To: Alex Gedalin <agedalin@tesla.com>; John Paul Jose <jojose@tesla.com>; David Zhang <dazhang@tesla.com>; Mohammed Damia <mdamia@tesla.com>; Bruce Watson <bruwatson@tesla.com>; John Sheridan <jsheridan@tesla.com>
Cc: Prabhakar Marishetty <pmarishetty@tesla.com>; Andre Gava <agava@tesla.com>; Emily Johnson <emilyjohnson@tesla.com>; Shaun Heimlich <sheimlich@tesla.com>; Prasath Ramakrishnan <pramakrishnan@tesla.com>; Daniel Ho <DanHo@tesla.com>; Srikanth Kotipalli <skotipalli@tesla.com>; Ashwin Krishnappa Kumar <askumar@tesla.com>; Mike Muren <mmuren@tesla.com>; Liv Adams <oladams@tesla.com>; Chris Guenther <cguenther@tesla.com>; Michael Bowling <mbowling@tesla.com>
Subject: RE: Module Yield report not working

Hey Alex,

I agree it makes sense to enforce a standard operating procedure but also want to make sure we are capturing all scrap. Are we able to add an Exception tab to this report which will catch serials which are scrapped improperly?

Thanks,

Scott

From: Alex Gedalin
Sent: Wednesday, April 25, 2018 7:07 PM
To: John Paul Jose <jojose@tesla.com>; David Zhang <dazhang@tesla.com>; Mohammed Damia <mdamia@tesla.com>; Bruce Watson <bruwatson@tesla.com>; John Sheridan <jsheridan@tesla.com>
Cc: Scott Smith <scosmith@tesla.com>; Prabhakar Marishetty <pmarishetty@tesla.com>; Andre Gava <agava@tesla.com>; Emily Johnson <emilyjohnson@tesla.com>; Shaun Heimlich <sheimlich@tesla.com>; Prasath Ramakrishnan <pramakrishnan@tesla.com>; Daniel Ho <DanHo@tesla.com>; Srikanth Kotipalli <skotipalli@tesla.com>; Ashwin Krishnappa Kumar <askumar@tesla.com>; Mike Muren <mmuren@tesla.com>; Liv Adams <oladams@tesla.com>; Chris Guenther

<cguenther@tesla.com>
Subject: RE: Module Yield report not working

All,

I have been in contact with John Paul today regarding the best way to proceed.

This report was built during a time when products were scrapped through an API that did not require NC actions. So, the most reliable method to capture when items were scrapped, no matter the method used to scrap them, was by looking at the thing.modified for items with state ‘SCRAP’.

However, today we have a more mature system, and I’ve learned that all forms of scrap in the backend of MOS use NC actions. John Paul can provide more detail here, but the bottom line is that MOS is now setup to handle scrap by looking at closed NCs with and “NC Action Disposition” of ‘SCRAP.’

Therefore, the proper way to track scrapped items with these advancements is to look at the time an NC was closed when it has an NC action disposition of ‘SCRAP.’ I updated the report to look solely at this timestamp, and the yield numbers are nearly identical to the last three (functional) days of the previous iteration of the Final Yield report. This is true for all BM zones other than current collector subassembly, which may be using another method to scrap items.

I have published this revamped report. Because the backbone of the MOS scrapping functionality uses NC Action, I feel that it is important to communicate to the organization that this is the official way to scrap a product, and if it is not scrapped in this way it will not be counted. John Paul mentioned that everyone may not be familiar with this terminology, but if people use NCs, MRB Sort, or MRB API to scrap, they are scrapping through NC Action.

Thanks and interested to hear other thoughts on how we should proceed - it seems to me like this is the most robust solution. Here is the link to the updated report: <http://bi.teslamotors.com/#/workbooks/29436/views>

Best,
Alex

From: John Paul Jose
Sent: Wednesday, April 25, 2018 2:02 PM
To: David Zhang <dazhang@tesla.com>; Mohammed Damia <mdamia@tesla.com>; Bruce Watson <bruwatson@tesla.com>; John Sheridan <jsheridan@tesla.com>; Alex Gedalin <agedalin@tesla.com>
Cc: Scott Smith <scosmith@tesla.com>; Prabhakar Marishetty <pmarishetty@tesla.com>; Andre Gava <agava@tesla.com>; Emily Johnson <emilyjohnson@tesla.com>; Shaun Heimlich <sheimlich@tesla.com>; Prasath Ramakrishnan <pramakrishnan@tesla.com>; Daniel Ho <DanHo@tesla.com>; Srikanth Kotipalli <skotipalli@tesla.com>; Ashwin Krishnappa Kumar <askumar@tesla.com>; Mike Muren <mmuren@tesla.com>; Liv Adams <oladams@tesla.com>
Subject: RE: Module Yield report not working

Hello David,
I previously reported the below:

“The data change requested is difficult to accomplish as the thing was indeed modified and internal logic changes that date when a thing is modified. A method of changing the thing.modified date back to the earlier date in MOS is being developed in order to accommodate the existing report assumptions, but this is not a fault with the MOS data, this is agreeing to change the definition of modified in this case to accommodate a report assumption. We will aim for 48 hours to develop a method, review and execute.”

I do still believe that changing the report assumption to not depend on thing.modified, which is not intended as a marker of scrap, would be more robust and people within quality are working with the report makers to explore that option, which may turn out to be both faster to execute and more robust.

Thank you,

From: John Paul Jose
Sent: Wednesday, April 25, 2018 12:29 PM
To: Prasath Ramakrishnan <pramakrishnan@tesla.com>; Alex Gedalin <agedalin@tesla.com>; Shaun Heimlich <sheimlich@tesla.com>; Emily Johnson <emilyjohnson@tesla.com>; David Zhang <dazhang@tesla.com>; Daniel Ho <DanHo@tesla.com>; Srikanth Kotipalli <skotipalli@tesla.com>; Ashwin Krishnappa Kumar <askumar@tesla.com>; John Sheridan <jsheridan@tesla.com>; Mike Muren <mmuren@tesla.com>; Mohammed Damia <mdamia@tesla.com>; John Moore <johnmoore@tesla.com>
Cc: Oleksiy Illyashov <oillyashov@tesla.com>
Subject: RE: Scrap Report 4/16/2018

Hello Prasath,

Yes, interested parties can work with me to potentially add a scrap date to the data model. We need to include John Moore as well, I added him to this email. The situation at present reflects the fact that MOS was built as an execution system, and a reporting system would have different optimizations. Still, this may be key enough to add to the data model of MOS to avoid situation like this.

The data change requested is difficult to accomplish as the thing was indeed modified and internal logic changes that date when a thing is modified. A method of changing the thing.modified date back to the earlier date in MOS is being developed in order to accommodate the existing report assumptions, but this is not a fault with the MOS data, this is agreeing to change the definition of modified in this case to accommodate a report assumption. We will aim for 48 hours to develop a method, review and execute.

Thank you,

John Paul Jose | Staff Product Manager, Manufacturing Quality Analytics
45500 Fremont Blvd | Fremont, CA 94538
c 775.276.7604 | e jojose@tesla.com

John Paul Jose | Staff Product Manager, Manufacturing Quality Analytics
45500 Fremont Blvd | Fremont, CA 94538
c 775.276.7604 | e jojose@tesla.com



From: David Zhang
Sent: Wednesday, April 25, 2018 1:55 PM
To: Mohammed Damia <mdamia@tesla.com>; John Paul Jose <jojose@tesla.com>; Bruce Watson <bruwatson@tesla.com>; John Sheridan <jsheridan@tesla.com>; Alex Gedalin <agedalin@tesla.com>
Cc: Scott Smith <scosmith@tesla.com>; Prabhakar Marishetty <pmarishetty@tesla.com>; Andre Gava <agava@tesla.com>; Emily Johnson <emilyjohnson@tesla.com>; Shaun Heimlich <sheimlich@tesla.com>; Prasath Ramakrishnan <pramakrishnan@tesla.com>; Daniel Ho <DanHo@tesla.com>; Srikanth Kotipalli <skotipalli@tesla.com>; Ashwin Krishnappa Kumar <askumar@tesla.com>; Mike Muren <mmuren@tesla.com>
Subject: RE: Module Yield report not working

Thanks John Paul and Mohammed.

When will the fix be implemented and the reports back up?

From: Mohammed Damia
Sent: Wednesday, April 25, 2018 12:40 PM
To: John Paul Jose <jojose@tesla.com>; Bruce Watson <bruwatson@tesla.com>; John Sheridan <jsheridan@tesla.com>; Alex Gedalin <agedalin@tesla.com>
Cc: Scott Smith <scosmith@tesla.com>; Prabhakar Marishetty <pmarishetty@tesla.com>; Andre Gava <agava@tesla.com>; Emily Johnson <emilyjohnson@tesla.com>; Shaun Heimlich <sheimlich@tesla.com>; David Zhang <dazhang@tesla.com>; Prasath Ramakrishnan <pramakrishnan@tesla.com>; Daniel Ho <DanHo@tesla.com>; Srikanth Kotipalli <skotipalli@tesla.com>; Ashwin Krishnappa Kumar <askumar@tesla.com>; Mike Muren <mmuren@tesla.com>
Subject: Re: Module Yield report not working

+ others and combining 2 email threads into one.
Please see email below.
The root cause was identified, thanks to John Paul.

On 4/25/18, 8:52 AM, "John Paul Jose" <jojose@tesla.com> wrote:

Bruce,
Please allow me to give the full picture here:

At the time of creation of this particular yield report the originator made the decision to use a field from the MOS database called thing.modified to represent the day/time of scrap. Note that is not actually the MOS record of scrap. The MOS record of scrap is based on the day/time of state transition to the state called SCRAP. It takes some more data wrangling to get to that state transition timestamp for each thing, so it was probably for speed at convenience that the thing.modified timestamp was chosen for the report.

Using the most recent thing.modified timestamp turned out to be a good enough assumption for scrapped things up until Saturday when a new data field was added to MOS for manufacturing date. The act of populating that manufacturing date rightly changed the thing.modified date since adding a manufacturing date to it is indeed a modification of the thing record. (The date changed for all things in the data base, not just scrap). The thing.modified date was not even explicitly changed, it was changed by internal logic when a qualifying data event occurred (in this case adding thing manufacturing date). Note this change did nothing to obscure or confuse the transition to state SCRAP.

I’ve communicated with John and Alex that as a MOS team we will attempt to re-update the thing.modified date to the previous value to make the reports keep working without any change needed, but that is not easy since internal logic changes that thing.modified date, so even if we adjusted it, it would overwrite itself again. This can be defeated, but would require downtime if we were to turn it off. There are other advanced techniques that may be used to defeat it without downtime and we are looking into those, but there is a counter opinion that the master data records do need correct thing.modified recording meaning this thing.modified date change is correct and necessary for data cahnge record keeping. (That is the purpose of the field, not to say when things were scrapped).

Finally, we looped in Quality Data Science in Fremont to see how they are looking at scrap, and this suggestion was made:
Since MOS keeps rows of history for each thing, use the *earliest* modified date when the state changed to scrap, not the most recent one.
Using that logic in the report would avoid any repeat of the issue we just saw whenever any new data fields are added to the thing table.

I believe the best option would be to modify the report for robustness as described above (Alex might be working on that), but will also keep pursuing the difficult and somewhat controversial change to the thing.modified date and I will let you know the outcome.

Thanks,

John Paul Jose | Staff Product Manager, Manufacturing Quality Analytics
45500 Fremont Blvd | Fremont, CA 94538
c 775.276.7604 | e jojose@tesla.com

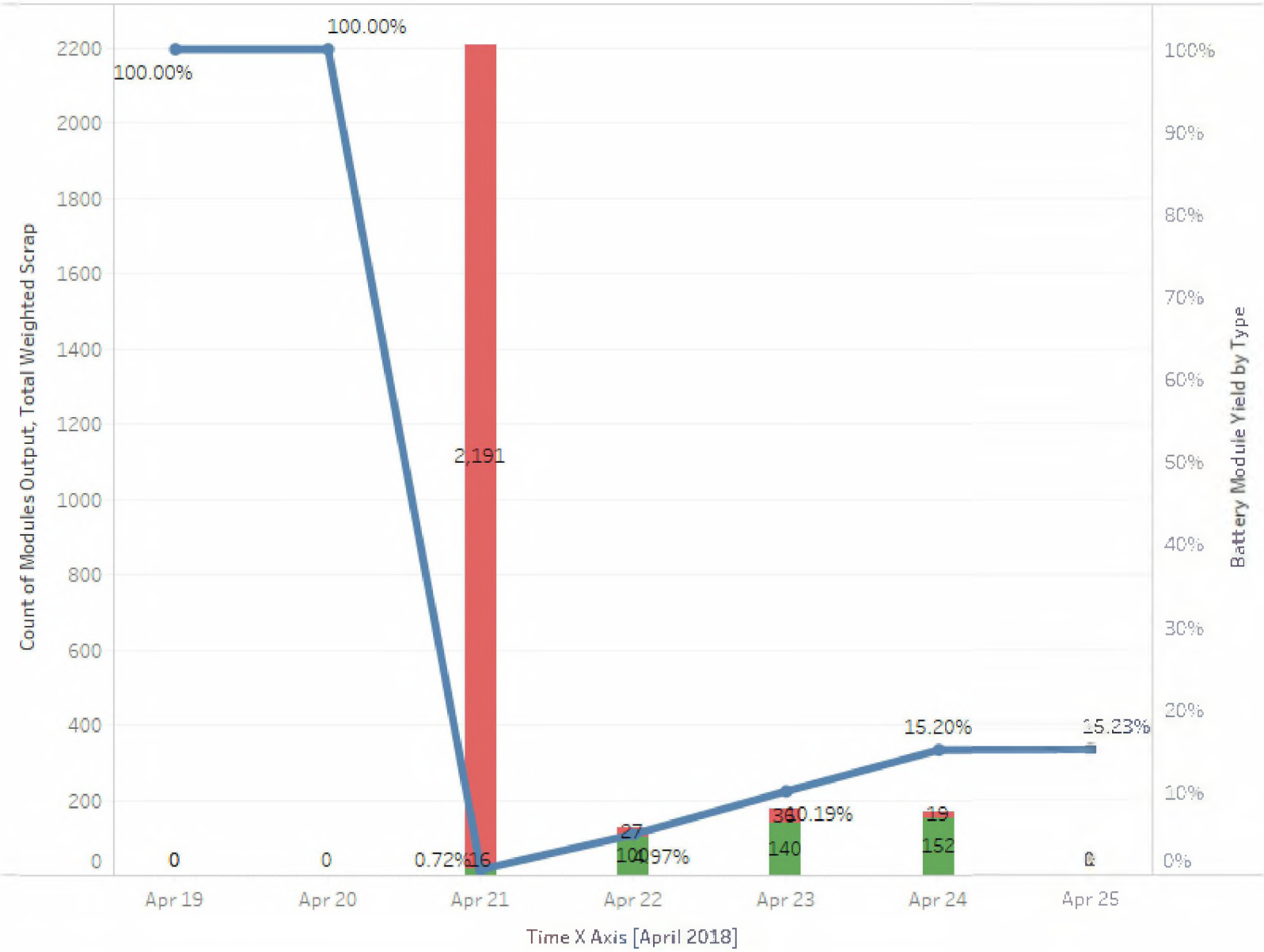


From: Bruce Watson
Sent: Wednesday, April 25, 2018 7:21 AM
To: John Paul Jose <jojose@tesla.com>; John Sheridan <jsheridan@tesla.com>; Alex Gedalin <agedalin@tesla.com>; Mohammed Damia <mdamia@tesla.com>
Cc: Scott Smith <scosmith@tesla.com>; Prabhakar Marishetty <pmarishetty@tesla.com>; Andre Gava <agava@tesla.com>
Subject: RE: Module Yield report not working

Team – What’s the latest on getting this corrected? Yield report/underlying data is still incorrect.

Final Yield All Battery Module

Vehicle Sets



From: John Paul Jose
Sent: Monday, April 23, 2018 5:19 PM
To: John Sheridan <jsheridan@tesla.com>; Alex Gedalin <agedalin@tesla.com>; Mohammed Damia <mdamia@tesla.com>
Cc: Scott Smith <scosmith@tesla.com>; Prabhakar Marishetty <pmarishetty@tesla.com>; Andre Gava <agava@tesla.com>; Bruce Watson <bruwatson@tesla.com>
Subject: RE: Module Yield report not working

John and Alex,
I have started the process by making a placeholder MOPS ticket:

<https://issues.teslamotors.com/browse/MOPS-2604>

We will need developers including Prabhakar to review the best script/CR updates to have the least unintended consequence- as you can see the last ticket was reviewed but still caused impact to this scrap report.

These updates have a several layer review and typically take a few days to get through the entire process including execution.

I'll walk this one through the approval steps as there are at least 3 people who will have to take the following steps: script testing and creation, CR review, and execution.

Thanks,

John Paul Jose | Staff Product Manager, Manufacturing Quality Analytics
45500 Fremont Blvd | Fremont, CA 94538
c 775.276.7604 | e jojose@tesla.com



From: John Sheridan
Sent: Monday, April 23, 2018 4:51 PM
To: John Paul Jose <jojose@tesla.com>; Alex Gedalin <agedalin@tesla.com>; Mohammed Damia <mdamia@tesla.com>
Cc: Scott Smith <scosmith@tesla.com>; Prabhakar Marishetty <pmarishetty@tesla.com>; Andre Gava <agava@tesla.com>; Bruce Watson <bruwatson@tesla.com>
Subject: Re: Module Yield report not working

John Paul –

For our reporting to be accurate and be able to look back at any time, I think we need the dates to be corrected.

What would this take?
2nd script and re-update those things with newly post-dated thing.modified dates based on the NCs that scrapped them.

-John

From: John Paul Jose <jojose@tesla.com>
Date: Monday, April 23, 2018 at 4:40 PM
To: John Sheridan <jsheridan@tesla.com>, Alex Gedalin <agedalin@tesla.com>, Mohammed Damia <mdamia@tesla.com>
Cc: Scott Smith <scosmith@tesla.com>, Prabhakar Marishetty <pmarishetty@tesla.com>
Subject: RE: Module Yield report not working

John and Alex,
Prabhakar took a look and found thing.modified was impacted by a MOPS ticket:
<https://issues.teslamotors.com/browse/MOPS-2309>

If you can use this information in the MOPS ticket to exclude certain ones from your reporting, great, if not, it may be possible to make a 2nd script and re-update those things with newly post-dated thing.modified dates based on the NCs that scrapped them.

Let me know how you want to proceed.

John Paul Jose | Staff Product Manager, Manufacturing Quality Analytics
45500 Fremont Blvd | Fremont, CA 94538
c 775.276.7604 | e jojose@tesla.com



From: John Sheridan
Sent: Monday, April 23, 2018 4:09 PM
To: Alex Gedalin <agedalin@tesla.com>; John Paul Jose <jojose@tesla.com>; Mohammed Damia <mdamia@tesla.com>
Cc: Scott Smith <scosmith@tesla.com>
Subject: Re: Module Yield report not working

John Paul –

Any updates on this? Are there others we need to loop in to understand the changes?
We need to provide Finance an update today as they use this report to book scrap on a weekly basis. We are currently out of sync.

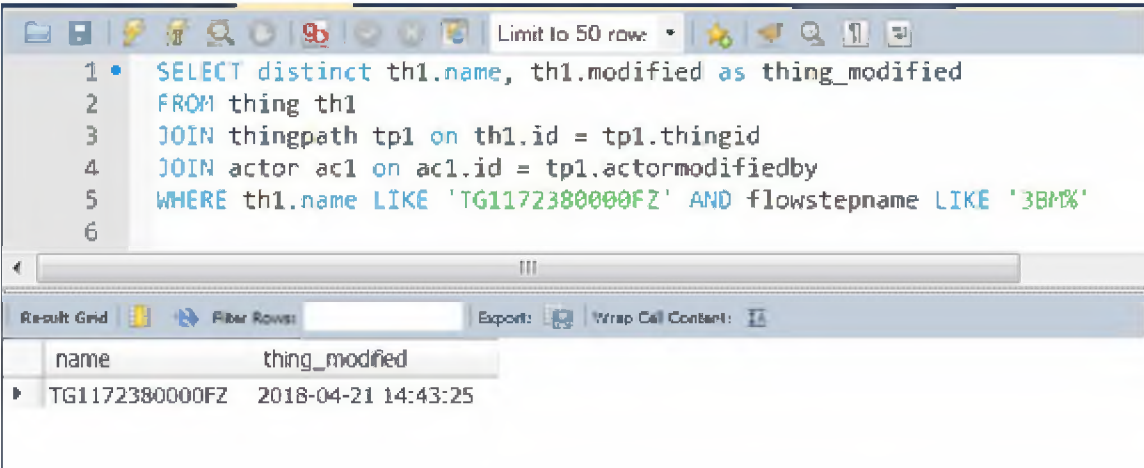
Thanks,
John

From: Alex Gedalin <agedalin@tesla.com>
Date: Monday, April 23, 2018 at 2:31 PM
To: John Paul Jose <jojose@tesla.com>, Mohammed Damia <mdamia@tesla.com>, Adithya Vijayakumar <advijayakumar@tesla.com>, John Sheridan <jsheridan@tesla.com>
Cc: Andre Gava <agava@tesla.com>, Sunny Balasubramanian <sbalasubramanian@tesla.com>, Bruce Watson <bruwatson@tesla.com>, Charlie Hill <chahill@tesla.com>, Sanket Bhanage <sbhanage@tesla.com>, Spencer Saunders <ssaunders@tesla.com>, Jigar Shah <jshah@tesla.com>
Subject: RE: Module Yield report not working

John Paul Jose,

I decided to dig into modified timestamps for a product scrapped on 4/21.

It looks like the thing.modified timestamp in sparq is 4/21:



The dashboard prioritized thing.modified over naction.modified, so this is what will be displayed. However, digging into MOS for the NCs, we see the following:

3BM-Module-3BM-53020

UP

Things, Steps, Processes

Traveler

Task

NCs (1)

Genealogy

Step

Complete

Next StepAutomatic Routing

Nonconformances

NC Number	Status	Flow Step	Suspect Part	Symptom	NC Description	Repaired Part No	Action Disposition	Action Log	Action Created	NC Created
TG1172380000FZ-4	OPEN	3BM-53020	1091595-00-E: ASY,MODULE 1,HVBAT,M3	BROKEN	broken side mounts negative end	1091593-00-D	SCRAP	ScrapModule: Sidemount - Crack/Damage.	09-18-2017 12:41:24	09-18-2017 12:41:24

It looks like the “Action created” and “NC created” timestamps were back in 9/18/2017. This means the last time the thing should have been modified was during the scrapping around 9/18. Which makes me think the thing.modified timestamp was overwritten this weekend.

Would this theory make sense to you? What could have overwritten a previous thing.modified timestamp, maybe during this mass scrap the timestamp was overwritten somehow?

Thank you for the help,
Alex

From: John Paul Jose
Sent: Monday, April 23, 2018 1:46 PM
To: Alex Gedalin <agedalin@tesla.com>; Mohammed Damia <mdamia@tesla.com>; Adithya Vijayakumar <advijayakumar@tesla.com>; John Sheridan <jsheridan@tesla.com>
Cc: Andre Gava <agava@tesla.com>; Sunny Balasubramanian <sbalasubramanian@tesla.com>; Bruce Watson <bruwatson@tesla.com>; Charlie Hill <chahill@tesla.com>; Sanket Bhanage <sbhanage@tesla.com>; Spencer Saunders <ssaunders@tesla.com>; Jigar Shah <jshah@tesla.com>
Subject: RE: Module Yield report not working

For Alex’s question:

“– John Paul Jose, could an MOS update have changed the “modified” timestamps for things in MOS?”

My answer: MOS team did not update timestamps as an over-write to the best of my knowledge, there were only code changes for going forward.

John Paul Jose | Staff Product Manager, Manufacturing Quality Analytics
45500 Fremont Blvd | Fremont, CA 94538
c 775.276.7604 | e jojose@tesla.com



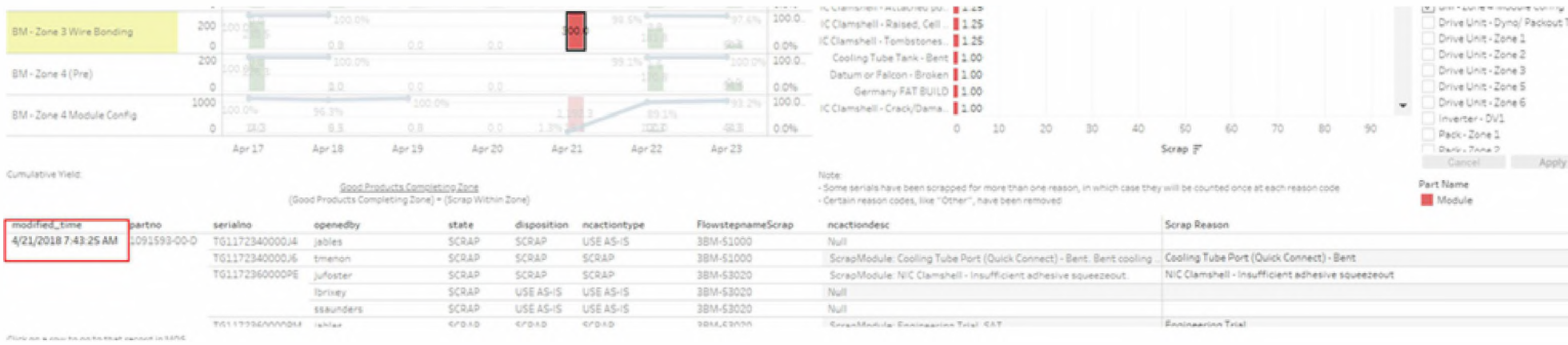
From: Alex Gedalin
Sent: Monday, April 23, 2018 1:39 PM
To: Mohammed Damia <mdamia@tesla.com>; Adithya Vijayakumar <advijayakumar@tesla.com>; John Sheridan <jsheridan@tesla.com>; John Paul Jose <jojose@tesla.com>
Cc: Andre Gava <agava@tesla.com>; Sunny Balasubramanian <sbalasubramanian@tesla.com>; Bruce Watson <bruwatson@tesla.com>; Charlie Hill <chahill@tesla.com>; Sanket Bhanage <sbhanage@tesla.com>; Spencer Saunders <ssaunders@tesla.com>; Jigar Shah <jshah@tesla.com>
Subject: RE: Module Yield report not working

+ John, John Paul Jose

It looks like the big scrap day hit most of the BM zones:



It looks like the majority of them were all scrapped at once:



Looks like a big WIP dump. I recalled there were some MES/MOS updates going on during the weekend – John Paul Jose, could an MOS update have changed the “modified” timestamps for things in MOS?

Thanks,
Alex

From: Mohammed Damia
Sent: Monday, April 23, 2018 12:12 PM
To: Adithya Vijayakumar <advijayakumar@tesla.com>
Cc: Andre Gava <agava@tesla.com>; Alex Gedalin <agedalin@tesla.com>; Sunny Balasubramanian <sbalasubramanian@tesla.com>; Bruce Watson <bruwatson@tesla.com>; Charlie Hill <chahill@tesla.com>; Sanket Bhanage <sbhanage@tesla.com>; Spencer Saunders <ssaunders@tesla.com>; Jigar Shah <jshah@tesla.com>
Subject: Re: Module Yield report not working

Are they config modules? I know bp scrapped a bunch yesterday.

Sent from my iPhone

On Apr 23, 2018, at 11:12 AM, Adithya Vijayakumar <advijayakumar@tesla.com> wrote:

+ Mohammad

We did a state change for the bandolier serials (just serials and cooling tubes) but not for the modules.

Hi Mohammad,

Was this something done by the MOS team based on a different request?

Thanks,

Adithya Vijayakumar | Process Engineer, Gigafactory 1
Electric Avenue | Sparks, NV 89434
540-449-6239 | advijayakumar@tesla.com

From: Andre Gava
Sent: Monday, April 23, 2018 11:07 AM
To: Alex Gedalin <agedalin@tesla.com>; Sunny Balasubramanian <sbalasubramanian@tesla.com>
Cc: Bruce Watson <bruwatson@tesla.com>; Charlie Hill <chahill@tesla.com>; Sanket Bhanage <sbhanage@tesla.com>; Spencer Saunders <ssaunders@tesla.com>; Adithya Vijayakumar <advijayakumar@tesla.com>; Jigar Shah <jshah@tesla.com>
Subject: RE: Module Yield report not working

We didn't have zero scrap in the previous days till April 16. This report was OK till Friday, then today it zeroed the scraps and added everything on April 21.

From: Alex Gedalin
Sent: Monday, April 23, 2018 10:32 AM
To: Andre Gava <agava@tesla.com>; Sunny Balasubramanian <sbalasubramanian@tesla.com>
Cc: Bruce Watson <bruwatson@tesla.com>; Charlie Hill <chahill@tesla.com>; Sanket Bhanage <sbhanage@tesla.com>; Spencer Saunders <ssaunders@tesla.com>; Adithya Vijayakumar <advijayakumar@tesla.com>; Jigar Shah <jshah@tesla.com>
Subject: RE: Module Yield report not working

+ Process Engineers

Did we clean out WIP on April 21?

Thanks,
Alex

From: Andre Gava
Sent: Monday, April 23, 2018 9:16 AM
To: Alex Gedalin <agedalin@tesla.com>; Sunny Balasubramanian <sbalasubramanian@tesla.com>
Cc: Bruce Watson <bruwatson@tesla.com>
Subject: Module Yield report not working

http://bi.teslamotors.com/#/views/Model3FinalYieldandScrap_0/FinalYield-AllBatteryModule_1?iid=5&original_view=y

It went really off, it is not counting the scrap correctly

<image001.png>

MySQL Workbench

File Edit View Query Database Server Tools Scripting Help

Navigator

MANAGEMENT

Server Status

Client Connections

Users and Privileges

Status and System Variables

Data Export

Data Import/Restore

INSTANCE

Startup / Shutdown

Server Logs

Options File

PERFORMANCE

Dashboard

Performance Reports

Performance Schema Setup

SCHEMAS

Filter objects

bk_tickets

dashboard

manage_mos

persona

reportdb

sparg

Tables

_thing_new

activecardcontainers

activecontainers

activeparents

activepickitemcontainers

actor

actor_a

actordepartmentmap

actorpermission

actorpermission_a

allinactivecontainertags

ar

ar_a

area

artifact

artifactlink

asn

asndetail

badcontainertags

Yield Calculator

NCs OPENED BY FLOWSTEP

SQL File 18

SQL File 6

3BM Inventory Query

TopParentSearch

SQL File 7

Containment Query

1

2

3

4

5

6

7

8

9

10

Select CONVERT_TZ(nc.opened,'UTC','US/Pacific') as PSTAdjust, nc.thingname, nc.description, nc.state, nc.symptom, nc.flowstepname, thing.state

From nc

join thing on nc.thingname = thing.name

where nc.partnumber like '109408'

and CONVERT_TZ(nc.opened,'UTC','US/Pacific') >= '2018-01-01 06:00:00'

-- and nc.description like '%FYI%'

-- and nc.state = 'OPEN'

and thing.state = 'SCRAP'

Result Grid

Filter Rows

Exports

Wrap Cell Contents

Fetch rows

PSTAdjust	thingname	description	state	symptom	flowstepname	state
2018-04-29 14:52:05	TG117317000233	Cooling Tube - Too high - Middle	CLOSED	POOR FIT	3BM-20000-NCM	SCRAP
2018-04-29 14:38:35	TG117317000233	Cell - Touchino	OPEN	POOR FIT	3BM-20000-NCM	SCRAP
2018-04-29 14:41:51	TG117317000233	Cell - Touchino	OPEN	POOR FIT	3BM-20000-NCM	SCRAP
2018-04-29 14:44:47	TG117317000233	Cell - Touchino	OPEN	POOR FIT	3BM-20000-NCM	SCRAP
2018-04-29 14:47:45	TG117317000233	Cell - Touchino	OPEN	POOR FIT	3BM-20000-NCM	SCRAP
2018-04-29 14:48:58	TG117317000233	Cell - Touchino	OPEN	POOR FIT	3BM-20000-NCM	SCRAP
2018-04-29 14:36:31	TG117317000233	Cell - Touchino	OPEN	POOR FIT	3BM-20000-NCM	SCRAP
2018-04-29 14:35:21	TG117317000233	Cell - Touchino	OPEN	POOR FIT	3BM-20000-NCM	SCRAP
2018-04-29 14:38:23	TG117317000233	Cell - Touchino	OPEN	POOR FIT	3BM-20000-NCM	SCRAP
2018-04-29 14:49:46	TG117317000233	Tank - Bent	OPEN	COSMETIC/DAMAGE	3BM-20000-NCM	SCRAP
2018-04-29 14:52:04	TG117317000233	Cooling Tube - Too high - Middle	OPEN	POOR FIT	3BM-20000-NCM	SCRAP
2018-04-29 14:54:50	TG1173410005VD	Cell - Touchino	OPEN	POOR FIT	3BM-20000-NCM	SCRAP
2018-04-29 14:54:51	TG1173410005VD	Cell - Touchino	CLOSED	POOR FIT	3BM-20000-NCM	SCRAP
2018-04-04 15:33:11	TG1173420000BA	Old Revision parts-Pre stretched Cooling tubes	CLOSED	OTHER	MMS	SCRAP

Result 1

Output

Action Output

Message

Duration / Fetch

11

12

13

14

14 06:57

select CONVERT_TZ(nc.closed,'UTC','US/Pacific') as PSTAdjust, nc.thingname, nc.description, nc.partnumber, nc.symptom, nc.flowstepname, ...

417 row(s) returned

0.889 sec / 1.981 sec

12 14:07:24

select CONVERT_TZ(nc.closed,'UTC','US/Pacific') as PSTAdjust, nc.thingname, nc.description, nc.partnumber, nc.symptom, nc.flowstepname, ...

0 row(s) returned

1.888 sec / 0.000 sec

13 14:07:40

select CONVERT_TZ(nc.closed,'UTC','US/Pacific') as PSTAdjust, nc.thingname, nc.description, nc.partnumber, nc.symptom, nc.flowstepname, ...

0 row(s) returned

1.857 sec / 0.000 sec

14 14:08:37

select CONVERT_TZ(nc.opened,'UTC','US/Pacific') as PSTAdjust, nc.thingname, nc.description, nc.state, nc.symptom, nc.flowstepname, thing...

63006 row(s) returned

22.292 sec / 5.897 sec

SQL-Additions

My Snippets

First Pass Query

NCM PM Stator Query

NCM IM-PM Stab Stator Query

Scrap Check

ScrapByDate

ScrapByDate-Actor

ScrapByDate-DateRange

Scrap By Date Range/Scrapped By

Scrap By Thing ID

PM Stator Query by THING ID

NCM PM Stabbed Stator Query

NCM PM Stator Query for 6am-6pm

NCM PM Stator Query w/England

NCM's Exited Today

Card Verify

Yield Calculator

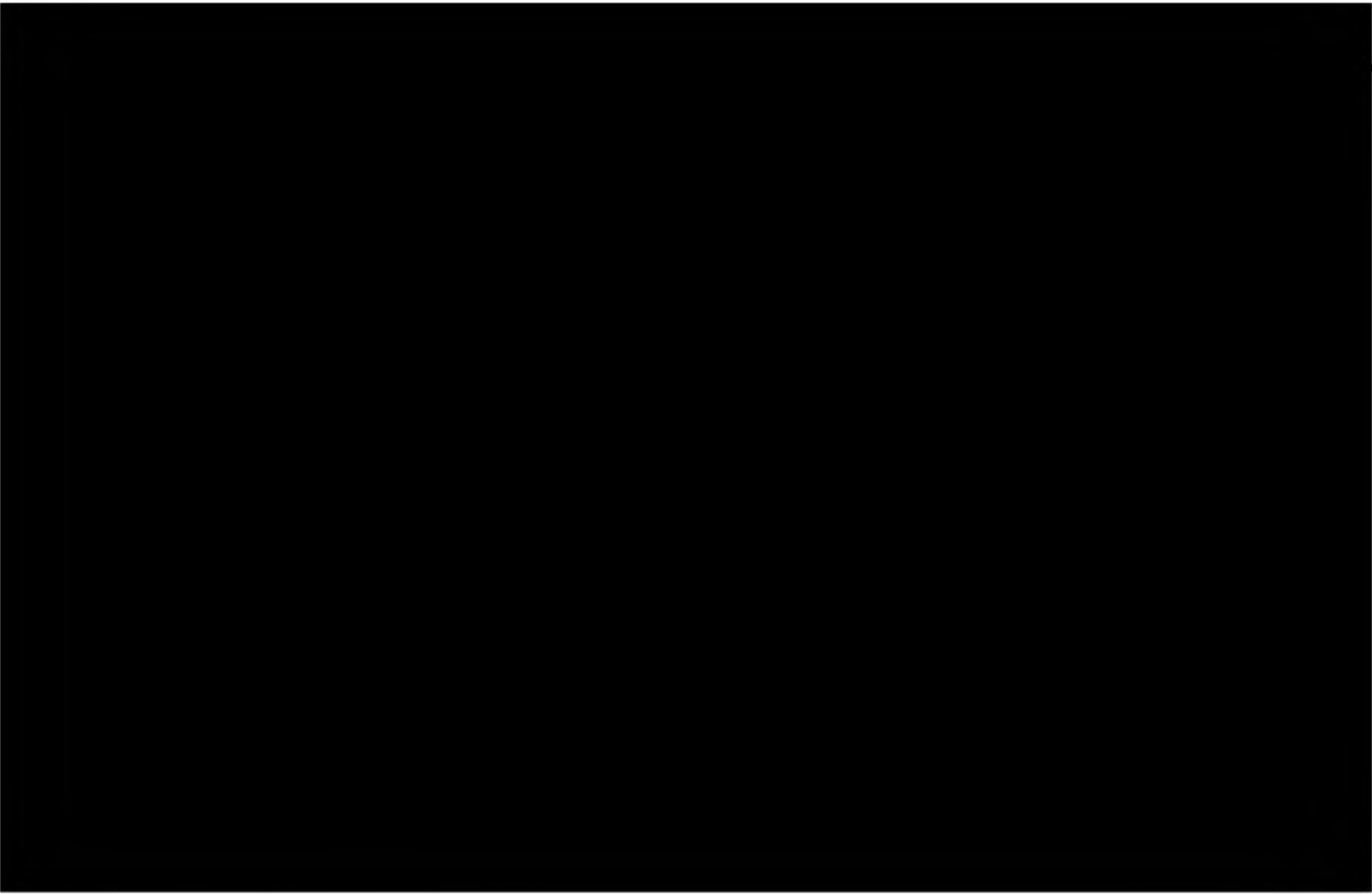
ASRS Current

ASRS by ThingID

Inventory - Child

ASRS Current NCMs





From: Elon Musk <erm@spacex.com>

Sent: Sunday, June 10, 2018 3:22 AM

To: Marty Tripp <mtripp@tesla.com>; Pedro Padilla <pepadilla@tesla.com>; Jens Peter Clausen <jpc@tesla.com>

Cc: Chris Lister <clister@tesla.com>; JB Straubel <jb@tesla.com>

Subject: Re: Module improvement idea

Getting scrap from when cells exit Panasonic to less than 1% needs to be a hardcore goal.

On Jun 8, 2018, at 4:04 PM, Marty Tripp <mtripp@tesla.com> wrote:

Chris,

Thanks for spending time with me today.

I would like to state that there are a LOT of concerned Tesla Employees. As we ramp up to 5000 + per week, EVERYONE is becoming increasingly concerned about the NCM Scrap for Bandoliers and Modules. I believe that integrating the assembly of bandoliers directly into the module assembly will alleviate the non-conformances that are occurring now.

Here are some guestimate numbers when we ramp up:

Bandolier Scrap per 24 hour period:

Lowest number forecasted by Engineering: 1200 per 24 hour period = 8400/week = approx 268,800 till year end

Lowest number forecasted by PTs and myself: 3000 per 24 hour period = 21000/week = approx 672,000 till year end.

We came up with this number by looking at the current scrap rate of 6.8%, and rounding it to 10%. As we ramp up, we will be working harder and faster, and that alone is going to cause a steady increase in failure compared to the output of FPY parts produced. We are currently seeing anywhere between 300 – 700 scrap bandoliers per shift in NCM.

A rough calculation of scrap cost for the remainder of the year is likely over \$200,000,000. Even more staggering to everyone is that we physically will not have any place to put the fallout.

I believe starting a project to rethink how the modules are being built is crucial to our sustainability. Some of us looked at how Energy is utilizing cell fixtures to manufacture the batteries and believe that a combination of the two processes can ultimately create a process that works for module.

If you're interested in seeing my idea more in-depth, I can draft something in Sketchup and send to you.

Thanks for your time.

Marty Tripp | Process Engineering Technician – NCM |
1 Electric Avenue | Sparks, NV 89434 | e mtripp@tesla.com

<image001.gif>

From: erm@tesla.com
Sent: Wednesday, June 20, 2018 10:22 AM
To: Marty Tripp
Subject: Re: Termination/Lawsuit

You are evil

> On Jun 20, 2018, at 10:03 AM, Marty Tripp <martytripp@icloud.com> wrote:

>

> I NEVER 'framed' anyone else or even insinuated anyone else as being involved in my production of documents of your MILLIONS OF DOLLARS OF WASTE, Safety concerns, lying to investors/the WORLD.

>

> Putting cars on the road with safety issues is being a horrible human being!

>

>

>> On Jun 20, 2018, at 10:00 AM, Elon Musk <erm@tesla.com> wrote:

>>

>> You should be ashamed of yourself for framing other people. You're a horrible human being.

>>

>>> On Jun 20, 2018, at 9:59 AM, Marty Tripp <martytripp@icloud.com> wrote:

>>>

>>> I never made a threat. I simply told you that you have what's coming.

>>>

>>> Thank you for this gift!!!!

>>>

>>>

>>>> On Jun 20, 2018, at 9:42 AM, Elon Musk <erm@tesla.com> wrote:

>>>>

>>>> Threatening me only makes it worse for you

>>>>

>>>>> On Jun 20, 2018, at 8:57 AM, Marty Tripp <martytripp@icloud.com> wrote:

>>>>>

>>>>> Don't worry, you have what's coming to you for the lies you have told to the public and investors.

From: Scott Smith
Sent: Thursday, June 21, 2018 11:39 AM
To: Adithya Vijayakumar;Michael Bowling
Subject: RE: Scrap Cost

Thanks Adithya this is great! I've downloaded Workbench so if you can send me the queries for these I might be able to become self-sufficient after a few more questions. 😊

Thanks,

Scott

From: Adithya Vijayakumar
Sent: Wednesday, June 20, 2018 11:09 PM
To: Scott Smith <scosmith@tesla.com>; Michael Bowling <mbowling@tesla.com>
Subject: RE: Scrap Cost

Hi Scott,

https://teslamotorsinc-my.sharepoint.com/:x:/r/personal/advijayakumar_tesla_com/Documents/YTD-Bandolier%20and%20Module%20Scrap%20and%20Child%20costs.csv?d=w8d91a5daef874c478640eb24ca39a286&csf=1&e=35u6WL

YTD Scrap for Modules and Bandoliers with Child part cost.

Thanks,

Adithya Vijayakumar | Process Engineer, Gigafactory 1
Electric Avenue | Sparks, NV 89434
540-449-6239 | advijayakumar@tesla.com

From: Adithya Vijayakumar
Sent: Wednesday, June 20, 2018 6:26 PM
To: Scott Smith <scosmith@tesla.com>; Michael Bowling <mbowling@tesla.com>
Subject: RE: Scrap Cost

The WIP file with child cost for Modules and Bandoliers (Since SOP Till date)

Thanks,

Adithya Vijayakumar | Process Engineer, Gigafactory 1
Electric Avenue | Sparks, NV 89434
540-449-6239 | advijayakumar@tesla.com

From: Scott Smith
Sent: Wednesday, June 20, 2018 6:09 PM

To: Adithya Vijayakumar <advijayakumar@tesla.com>; Michael Bowling <mbowling@tesla.com>

Subject: RE: Scrap Cost

Can we also pull genealogy of QTD scrap and NCM serials with genealogy?

Thanks,

Scott

From: Scott Smith

Sent: Wednesday, June 20, 2018 5:04 PM

To: Adithya Vijayakumar <advijayakumar@tesla.com>; Michael Bowling <mbowling@tesla.com>

Subject: RE: Scrap Cost

I am interested to see the genealogy of WIP serials.

Thanks,

Scott

From: Adithya Vijayakumar

Sent: Wednesday, June 20, 2018 4:54 PM

To: Michael Bowling <mbowling@tesla.com>

Cc: Scott Smith <scosmith@tesla.com>

Subject: RE: Scrap Cost

Hi Scott,

Is this cost for the Bandoliers that were scrapped physically but not virtually? Or for all virtual WIP?

Based on our discussion, I guess it is all virtual WIP with/without child parts (Bandolier and Module) ?

Thanks,

Adithya Vijayakumar | Process Engineer, Gigafactory 1

Electric Avenue | Sparks, NV 89434

540-449-6239 | advijayakumar@tesla.com

From: Adithya Vijayakumar

Sent: Tuesday, June 19, 2018 12:47 PM

To: Michael Bowling <mbowling@tesla.com>

Subject: RE: Scrap Cost

Hi Mike,

Is this cost for the Bandoliers that were scrapped physically but not virtually? Or for all virtual WIP?

Thanks,

Adithya Vijayakumar | Process Engineer, Gigafactory 1

Electric Avenue | Sparks, NV 89434

540-449-6239 | advijayakumar@tesla.com

From: Erica Chen
Sent: Friday, June 22, 2018 7:55 AM
To: Sarah O'Brien
Cc: DL-USComms
Subject: Re: Martin Tripp Coverage

Not really – other than our Giga statement, I'm not seeing our points in media coverage. Stories are highlighting quotes from his interviews with The Guardian, WaPo, etc.

From: Sarah O'Brien <sobrien@tesla.com>
Date: Friday, June 22, 2018 at 7:37 AM
To: Erica Chen <echen@tesla.com>
Cc: DL-USComms <DL-USComms@tesla.com>
Subject: Re: Martin Tripp Coverage

Thanks Erica

Does it look to you like our messaging is coming through?

On Jun 22, 2018, at 7:34 AM, Erica Chen <echen@tesla.com> wrote:

Media continue to report on how Tesla sued Martin Tripp, who “is attacking Tesla in the media in return” and plans to file a counter-lawsuit against Tesla for “a lot more than what they’re asking from me.” The “explosive” email exchange between Elon and Martin, where they “battled it out,” is seen throughout coverage, with most stories including it in full. Motherboard comments, “The saga of Tesla’s saboteur just got even weirder,” while TechCrunch notes that the lawsuit “was filed just 24 hours ago and it’s already ripe fodder for Hollywood...Get ready, its exhausting.” Engadget thought it “was an exchange unlike anything we’ve ever seen released from a CEO, but as usual, Musk does things very differently.” Electrek states, “It is certainly not looking good for Tripp...I don’t see how he thought it would be a good idea to not only send that email to Musk but also leak it to the media thinking he is coming out of it looking good...The guy sounds like your average social media Tesla hater.” In the UK, BBC comments, “Tesla describes former employee Martin Tripp as a criminal, a man who hacked into Tesla’s systems in order steal information and sully the company’s reputation on safety.”

On the police call and Tripp threatening to shoot up the Gigafactory, media highlight both Tesla and the Storey County Sheriff’s department’s statements, but continue to be left confused as its “a developing and complex story.”

Another growing theme throughout coverage is that this past year “has been an especially fraught one” for Tesla, with problems “ranging from” Model 3 production and “a number of high-profile failures of its Autopilot system.” Cnet continues, “This kind of public fight is the last thing the company needs if it’s to achieve its goal of profitability by the end of the year.”

Motherboard, [Elon Musk Calls Tesla Leaker a 'Horrible Human Being' in Heated Email Exchange](#)
TechCrunch, [A Tesla telenovela](#)
Yahoo, [Tesla drama rolls on](#)
Mashable, [Elon Musk emails former Tesla employee accused in lawsuit for hacking](#)

Jalopnik, [Tesla Leaker Is 'Looking Forward To The Lawsuit' Over Alleged Stolen Documents](#)
Business Insider, [Elon Musk called the Tesla whistleblower a 'horrible human being' in an explosive email exchange](#)
Business Insider, [Tesla whistleblower says Elon Musk is waging war on him for leaking information to Business Insider](#)
Cnet, [Elon Musk has it out with suspected Tesla saboteur](#)
Engadget, [Musk emails alleged Tesla saboteur, 'You're a horrible human being'](#)
Futurism, [Don't Mess With the Musk: Elon Sues Ex-Employee for Spilling Tesla Secrets](#)
The Street, [OPEC, Bank Stress Tests, Disney and Tesla - 5 Things You Must Know](#)
Electrek, [Tesla sabotage/data theft scandal becomes even crazier](#)
Silicon Valley Business Journal, [Ex-employee targeted by Tesla says he's a protected whistleblower](#)
Investor's Business Daily, [Tesla Aims To Outrun Cash Burn With Success Of Model 3 Production](#)
Cheddar, [Alleged Tesla 'Saboteur' Is Just One More Mess to Clean Up](#)
BGR, [Heated email exchange between Elon Musk and alleged factory saboteur surfaces](#)
Inverse, [Tesla Leaker Claims Battery Info 'Was Too Important Not To' Leak](#)
HypeBeast, [Emails Between Tesla's Alleged "Saboteur" & Elon Musk Surface](#)

UK:

BBC, [Musk's fury: Whistleblower or saboteur?](#)
The Independent [Tesla Calls Police On Ex-Employee 'Threatening To Shoot The Place Up'](#)
The Times, [I'm a whistleblower, claims Tesla worker sued for \\$1m](#)

From: Erica Chen <echen@tesla.com>
Date: Thursday, June 21, 2018 at 12:28 PM
To: DL-USComms <DL-USComms@tesla.com>
Subject: Re: Martin Tripp Coverage

Media continue to report on how Tesla sued Martin Tripp, who “is attacking Tesla in the media in return,” and on the email exchange between him and Elon. Motherboard comments, “The saga of Tesla’s saboteur just got even weirder,” while TechCrunch notes that the lawsuit “was filed just 24 hours ago and it’s already ripe fodder for Hollywood...Get ready, its exhausting.”

The predominate theme throughout coverage is that the case “is more confusing than ever” due to the “conflicting” statements. Electrek states, “It is certainly not looking good for Tripp...I don’t see how he thought it would be a good idea to not only send that email to Musk but also leak it to the media thinking he is coming out of it looking good...The guy sounds like your average social media Tesla hater.”

Motherboard, [Elon Musk Calls Tesla Leaker a 'Horrible Human Being' in Heated Email Exchange](#)
TechCrunch, [A Tesla telenovela](#)
Cnet, [Elon Musk has it out with suspected Tesla saboteur](#)
Electrek, [Tesla sabotage/data theft scandal becomes even crazier](#)
Silicon Valley Business Journal, [Ex-employee targeted by Tesla says he's a protected whistleblower](#)
Cheddar, [Alleged Tesla 'Saboteur' Is Just One More Mess to Clean Up](#)

<image001.png>

<image002.png>

From: Erica Chen <echen@tesla.com>
Date: Thursday, June 21, 2018 at 10:38 AM
To: DL-USComms <DL-USComms@tesla.com>
Subject: Martin Tripp Coverage

Media coverage of Tesla's lawsuit against Martin Tripp has shifted towards the "illuminating dialogue" between him and Elon, in addition to Tesla enhancing security at Gigafactory 1 after his friend said Tripp threatened to "shoot the place up." Stories note that the Storey County Sheriff's Office said deputies determined "there was no credible threat," leading Jalopnik to note that the story is "weird" and leaves them "puzzled about what's really going on here."

In an interview with Ars Technica, Tripp denied the threat, stating, "Absolutely not!" adding that "The ONLY thing I have said to any 'friends' is I sent a link to the CNBC article to five of them and asked if they really thought I was a hacker." He further explained that he first became concerned in December 2017 when he was "tasked with inventory of the stator line" and found that "no one seemed to care" about "the amount of waste that was being produced." He added, "When the cultural norm is to not care and continue building bad product, there's something wrong there. Any manufacturer I've ever been to (and I've been to a lot) would never allow for this. Since Tesla is running on investor money, it made it more concerning. In May it became immediately concerning when I was again tasked with inventory of the battery stuff and found huge discrepancies (100's of millions of dollars), and then the punctured cells." He said that he observed four cubic feet of what he described as "double walled cardboard containers filled multiple times per day" and added that there were "no standards for doing anything." When asked if he reported his concerns internally prior to going to media, he said he "did all the time," specifically saying it was "every day." He explained, "My Manager basically blew me off, stating that it was 'not a production line so scrap was a byproduct of getting it there.'" He added, "I made the comment that these are going into 'sellable cars' and he said 'yep' and walked away, his head held high. I then had to provide numbers to a group of engineers/production every morning and asked several times if anything was being done to rectify the issues. [I] even [had] a few meetings with my HR rep and brought the issues up."

The Washington Post comments, "The showdown has exposed a deep rancor in a tech giant that has become infamous for its head-turning cars, high-pressure workloads — and Musk, its unyielding boss," while Fortune states, "It's worth noting neither Tripp's nor Tesla's accusations have been independently verified. But if anything is clear, this war of words won't be ending anytime soon." Jalopnik writes, "It's a strange move to email someone you're suing, but since Tripp actually fired first, it gives me pause about the narrative the whistleblower is spinning publicly."

Ars Technica, [Tesla lawsuit target called "horrible human being" by CEO Elon Musk](#)
The Washington Post, [Saboteur or whistleblower? Battle between Elon Musk and former Tesla employee turns ugly, exposing internal rancor](#)
CNBC, [Tesla is enhancing security at Gigafactory, says they got a call that ex-employee was threatening violence](#)
Vanity Fair, [ELON MUSK'S "SABOTEUR" SAYS HE WITNESSED "REALLY SCARY THINGS" AT TESLA](#)
Fortune, [Tesla vs Former Employee Story Takes Bizarre Twist With an Alleged Threat](#)
NY Daily News, [Former employee sued by Tesla says he's a whistleblower — not a saboteur](#)
MarketWatch, [Tesla accuses fired employee of threatening to 'shoot the place up'](#)
Engadget, [Tesla enhances security following report of ex-employee threat](#)
Newsweek, [Tesla Says Threat to 'Shoot Up' Gigafactory Came From Friend of Sacked Employee](#)
The Drive, [Former Tesla Battery Factory Employee Allegedly Threatened to 'Shoot the Place Up'](#)
The Street, [Tesla Received Tip That Former Employee Was Going to 'Shoot the Place Up'](#)
Jalopnik, [Here's The Wild Email Exchange Between Tesla's Alleged 'Saboteur' And Elon Musk](#)

From: Shaun Heimlich

Sent: Wednesday, July 04, 2018 4:44 PM

To: Deepak Ahuja <deepak@tesla.com>; Peter Hochholdinger <phochholdinger@tesla.com>; Jens Peter Clausen <jpc@tesla.com>; Eddie Gates <EGates@tesla.com>; Justin McAnear <jmcanear@tesla.com>; Zachary Kirkhorn <ZKirkhorn@tesla.com>; Jerome Guillen <jerome@tesla.com>; Kevin Kassekert <kkassekert@tesla.com>; Andy Hamilton <ahamilton@tesla.com>; Josh Tech <jtech@tesla.com>; Shane Manciangli <smanciagli@tesla.com>; Warrick Taylor <wtaylor@tesla.com>; Alexandra Kantor <akantor@tesla.com>; Bonneville Eggleston <beggleston@tesla.com>; Daniel Ho <DanHo@tesla.com>; Pedro Padilla <pepadilla@tesla.com>; GSM_Managers <GSM_Managers@tesla.com>; Gabrielle Bressack <gbressack@tesla.com>; Tarak Makecha <tmakecha@tesla.com>; Gaurav Jain <gjain@tesla.com>; Afton Versteegh <aversteegh@tesla.com>; Scott Smith <scosmith@tesla.com>; Ric Caraballo <rcaraballo@tesla.com>; Shea Anderson <shanderson@tesla.com>; Katherine Beach <kbeach@tesla.com>; Joby Thomas <gethomas@tesla.com>; Katie Trainor <ktrainor@tesla.com>; Michael Schwekutsch <michael@tesla.com>; Robert Sumpf <rsumpf@tesla.com>; Aron Szcsey <aszecsev@tesla.com>; Sarah Kolbe <skolbe@tesla.com>; Josh Santos <jsantosheard@tesla.com>; Dorian West <dorian@tesla.com>; Omead Afshar <oafshar@tesla.com>; Katrina Vance <kvance@tesla.com>; Johnny Gannon <jgannon@tesla.com>; Drew Baglino <drew@tesla.com>; Daniel Beauboeuf <dbeauboeuf@tesla.com>; Eduardo Ramos Aguirre <eaguirre@tesla.com>; Janelle Floresca <jfloresca@tesla.com>;
Cc: Judy Wu <judy@tesla.com>; Amy Li <amli@tesla.com>; Jacqueline Meyer <jacmeyer@tesla.com>; Alex Cillo <acillo@tesla.com>; Judy Phyto <jphvo@tesla.com>; Emily Sun <esun@tesla.com>
Subject: Scrap report 6/25/2018

Hello All,

Please see below for Week of June 25, 2018 scrap summary based on QTD financials.

Model 3

Top Scrap Areas of the Week

From: Scott Smith
Sent: Thursday, July 05, 2018 2:26 PM
To: Michael Bowling
Cc: Shaun Heimlich
Subject: RE: Scrap report 6/25/2018

Hey Michael,

Last week's scrap looked very low. Is this real?

Thanks,

Scott

From: Shaun Heimlich
Sent: Wednesday, July 04, 2018 4:44 PM
To: Deepak Ahuja <deepak@tesla.com>; Peter Hochholdinger <phochholdinger@tesla.com>; Jens Peter Clausen <jpc@tesla.com>; Eddie Gates <EGates@tesla.com>; Justin McAnear <jmcanear@tesla.com>; Zachary Kirkhorn <ZKirkhorn@tesla.com>; Jerome Guillen <jerome@tesla.com>; Kevin Kassekert <kkassekert@tesla.com>; Andy Hamilton <ahamilton@tesla.com>; Josh Tech <jtech@tesla.com>; Shane Manciangli <smanciangli@tesla.com>; Warrick Taylor <wtaylor@tesla.com>; Alexandra Kantor <akantor@tesla.com>; Bonneville Eggleston <beggleson@tesla.com>; Daniel Ho <DanHo@tesla.com>; Pedro Padilla <pepadilla@tesla.com>; GSM_Managers <GSM_Managers@tesla.com>; Gabrielle Bressack <gbressack@tesla.com>; Tarak Makecha <tmakecha@tesla.com>; Gaurav Jain <gjain@tesla.com>; Afton Versteegh <aversteegh@tesla.com>; Scott Smith <scosmith@tesla.com>; Ric Caraballo <rcaraballo@tesla.com>; Shea Anderson <shanderson@tesla.com>; Katherine Beach <kbeach@tesla.com>; Joby Thomas <gethomas@tesla.com>; Katie Trainor <ktrainor@tesla.com>; Michael Schwekutsch <michael@tesla.com>; Robert Sumpf <rsumpf@tesla.com>; Aron Szecsey <aszecsey@tesla.com>; Sarah Kolbe <skolbe@tesla.com>; Josh Santos <jsantosheard@tesla.com>; Dorian West <dorian@tesla.com>; Omead Afshar <oafshar@tesla.com>; Katrina Vance <kvance@tesla.com>; Johnny Gannon <jgannon@tesla.com>; Drew Baglino <drew@tesla.com>; Daniel Beauboeuf <dbeauboeuf@tesla.com>; Eduardo Ramos Aguirre <eaguirre@tesla.com>; Janelle Floresca <jfloresca@tesla.com>
Cc: Judy Wu <judy@tesla.com>; Amy Li <amli@tesla.com>; Jacqueline Meyer <jacmeyer@tesla.com>; Alex Cillo <acillo@tesla.com>; Judy Phyto <jphyto@tesla.com>; Emily Sun <esun@tesla.com>
Subject: Scrap report 6/25/2018

Hello All,

Please see below for Week of June 25, 2018 scrap summary based on QTD financials.

- Model S/X, last week's scrap was **\$528/car** (includes Eng/Design), compared to QTD average of **\$492/car**.
 - \$144K – due to Lathrop test shot aluminum scrap
 - \$122K – due to BIW, MODEL X
- Model 3, last week's scrap was **\$510/car**, compared to QTD average of **\$1,338/car**.
 - \$665K – due to module scrap
 - \$525K – due to Bandolier scrap

Energy Scrap:

- Q2 QTD is **\$2,245K**
 - \$939K due to modules
 - \$558K due to DC Boards
 - \$301K due to cold plates
 - \$100k due to pods scrap

Model S/X

Executive Summary & Trend

Last Update [7.4.2018]		Latest Week Jun-25	Week Target	B/W	QTD Q1-2018	QTD Target	
Factory Gate Cars		1,899	1,977	(78)	24,960	25,696	
Factory Gate Cars - X		858	988	(130)	12,284	12,847	
Factory Gate Cars - S		1,041	988	53	12,676	12,849	
Scrap (\$K)		\$ 1,002	\$ 889	\$ (113)	\$ 12,273	\$ 11,563	\$
Process		849			8,906		
Material Quality		152			3,193		
Engineering		2			174		
Obsolescence (\$K)		\$ -			\$ 571		
Obsolescence Transacted		22			993		
Reserves Released		(22)			(423)		
Reserves Taken		0			-		
Vendor Obsolescence		0			-		
Scrap (\$/car)		\$ 528	\$ 450	\$ (78)	\$ 492	\$ 450	\$
Process		447			357		
Material Quality		80			128		
Engineering		1			7		

Top Scrap Areas of the Week & Quarterly Trends

	Week of Jun 25			Grand Total		Eng/Desi
	Eng/Design	Material Quality	Process			
Battery Module	\$237	\$32,873	\$100,430	\$133,541	Battery Module	\$6,824
Battery Pack			\$7,125	\$7,125	Battery Pack	\$3,650
Body in White		\$5,117	\$5,749	\$10,866	Body in White	
Electrics	\$4,875	\$1,998	\$24,070	\$30,944	Electrics	\$61,584
End of Line			\$6,055	\$6,055	End of Line	
General Assembly			\$8,554	\$8,554	General Assembly	\$38,544
Large Drive Unit	\$239		\$9,540	\$9,779	Large Drive Unit	\$1,297
Lathrop	\$1,043	\$37,105	\$126,715	\$164,863	Lathrop	\$73,823
Other			\$29,702	\$29,702	Other	
Paint			\$222,111	\$222,111	Paint	
Plastics			\$1,195	\$1,195	Plastics	
Powertrain-General		\$28	\$20,749	\$20,777	Production Control	
Production Control			\$3,378	\$3,378	Seat Manufacturin..	
Seat Manufacturing & Seats			\$953	\$953	Small Drive Unit	\$48,324
Small Drive Unit	\$3,657	\$27,454	\$126,667	\$157,779	Stamping	\$2,581
Stamping		\$1,315	\$41,500	\$42,815		

Model 3

Executive Summary & Trend

Last Update [7.4.2018]

Last Update [7.4.2018]	Latest Week		Week		QTD	
	Jun-25		Target	B/W	Q1-2018	QTD Target
Factory Gate Cars	4,384	2,332	2,052		28,643	30,318
Scrap (\$K)	\$ 2,237	\$ 4,058	\$ 1,821		\$ 38,326	\$ 52,753
Process	2,237				38,326	
Material Quality	-					
Engineering	-					
Obsolescence (\$K)	\$ 1,281				\$ 3,409	
Obsolescence Transacted	1,281				3,409	
Reserves Released	-					
Reserves Taken						
Vendor Obsolescence						
Scrap (\$/car)	\$ 510	\$ 1,740	\$ 1,230		\$ 1,338	\$ 1,740
Process	510				1,338	
Material Quality	0					
Engineering	0					

Top Scrap Areas of the Week

Row Labels	Sum of Scrap Cost
Coil	\$ 1,280,628
Module	\$ 1,239,355
Inverter	\$ 490,945
Drive Unit	\$ 206,342
GA	\$ 142,554
HV Battery	\$ 113,214
BIW	\$ 42,103
Seats	\$ 2,661
Grand Total	\$ 3,517,802

QTD by Area

Program	Scrap Cost
Module	\$ 28,947,890
Inverter	\$ 4,084,536
HV Battery	\$ 2,304,388
GA	\$ 1,933,240
Drive Unit	\$ 1,556,943
Coil	\$ 1,280,628
BIW	\$ 792,019
Seats	\$ 715,719
Grand Total	\$ 41,615,364

Top 10 Reasons for QTD module Scrap

Reason	Sum of Cost	Reason %
MC1-10000:HipotTest001	\$ 2,818,396.60	11%
Barb Damage	\$ 2,239,794.99	8%
Cell - Raised	\$ 2,049,169.74	8%
Cell - Touching	\$ 1,653,162.02	6%
Cell - Gap too wide	\$ 1,625,002.37	6%
Cooling Tube - Too high	\$ 1,253,389.83	5%
Cell - Dented	\$ 753,306.33	3%
3BM-20000:ProfilometerInspect001	\$ 690,659.21	3%
Others	\$ 425,131.23	2%
Incorrect Build	\$ 406,964.54	2%

From: Alexis Ramponi
Sent: Wednesday, July 11, 2018 1:05 PM
To: Arnaud Ruiz; Louis Larrus
Subject: FW: Gigafactory Scrap Value Calculations
Attachments: Bandoliers info; Q1'18 Bando Analysis; RE: Business Insider: Bandoliers Costs

From: Alexis Ramponi
Sent: Wednesday, June 27, 2018 5:52 PM
To: Kai Cheung <kcheung@tesla.com>
Cc: Manan Arora <marora@tesla.com>
Subject: FW: Gigafactory Scrap Value Calculations

From: Shaun Heimlich
Sent: Monday, June 18, 2018 1:25 PM
To: Eric Morrison <emorrison@tesla.com>; Judy Wu <judy@tesla.com>
Cc: Swapnil Bhatnagar <sbhatnagar@tesla.com>; Alexis Ramponi <aramponi@tesla.com>; Arnaud Ruiz <arnruiz@tesla.com>
Subject: RE: Gigafactory Scrap Value Calculations

Here is the bandolier email I sent him talking about duplication. The second email is the analysis that we also did to check the scrap against the third email I am attaching that had the bandolier analysis.

Let me know if I can help with anything else

Shaun

From: Eric Morrison
Sent: Monday, June 18, 2018 12:35 PM
To: Shaun Heimlich <sheimlich@tesla.com>; Judy Wu <judy@tesla.com>
Cc: Swapnil Bhatnagar <sbhatnagar@tesla.com>; Alexis Ramponi <aramponi@tesla.com>; Arnaud Ruiz <arnruiz@tesla.com>
Subject: Gigafactory Scrap Value Calculations

Judy, Shaun-

I was chatting with Katie in finance this morning and she mentioned that your team had completed the MOS data collection an initial analysis for Gigafactory scrap, and had given numbers to Deepak.

Is this something you can share with Internal Audit so we can understand the underlying data and calculations?

Please reach out to me directly if you would like to discuss.

From: Todd Maron
Sent: Saturday, July 14, 2018 7:52 AM
To: Sarah O'Brien; Dave Arnold
Subject: FW: James Phone p6
Attachments: file-6.jpeg; file3-5.jpeg; file2-5.jpeg; file1-6.jpeg

From: Nicholas Gicinto
Sent: Friday, July 13, 2018 7:13 PM
To: Lynn Miller <lynmiller@tesla.com>; Aarti Reddy <aareddy@tesla.com>; Todd Maron <todd@tesla.com>; Jake Nocon <jnocon@tesla.com>
Subject: James Phone p6

From: Sarah O'Brien
Sent: Tuesday, July 31, 2018 7:49 PM

Elon,

Below is the initial media coverage following Tripp's complaint. My recommendation would be that if we issue a blog, we do it after earnings. If we do it before, there's a possibility the call will be seen as an opportunity to cross-examine you. Also, its good for us to be focused on earnings, and to seem focused on the call.

The blog is attached and it includes tweaks we've made in light of

Media note "there isn't much new in the complaint," though it "does break down the claim in more details." Stories are focused on the Linette Lopez situation, scrap and the Gigafactory threat call.

Linette Lopez's story doesn't add much more to Tripp's claims but an engineer told her it was crazy that a "saboteur" could exist, as this person would have to have been a professional hacker. "Pushing malicious software onto other people's computers would not be possible without their authorization unless [the person were] a professional hacker. To which then I would say, 'Why is [Tripp] working as a process technician?'"

The Guardian says the countersuit "reasserts claims that Tripp had made to Business Insider about his concerns over 'high levels of waste and scrap,' 'unnerving, dangerous and wasteful business practices' and 'punctured battery modules.'" The Verge notes the filing says some of our previously released comments "are false, caused emotional distress, and have even led to 'numerous threats to his personal safety.'" Electrek comments, "While I would like to give Tripp the benefit of the doubt, his behavior online following the unfolding of the story made him lose a lot of credibilities."

Bloomberg, [Ex-Tesla Worker Called Saboteur Accuses Musk of Smearing Him](#)

The Verge, [Tesla whistleblower countersues over Elon Musk's 'defamatory' statements](#)

Ars Technica, [Ex-Tesla "bad apple" sues former employer, alleges "reassignment"](#)

Business Insider, [The ex-Tesla employee Elon Musk called a 'horrible human being' just slapped the company with a countersuit alleging defamation](#)

The Guardian, [Tesla countersued by 'whistleblower' it accused of sabotage and shooting threat](#)

Law360, [Tesla Hit With Defamation Counterclaim In 'Saboteur' Suit](#)

Jalopnik, [Tesla's Alleged 'Saboteur' Files \\$1 Million Defamation Suit Against Automaker](#)

Electrek, [Tesla 'saboteur/whistleblower' countersues automaker for \\$1 million as he denies claims](#)

From: Dave Arnold
Sent: Wednesday, August 01, 2018 12:53 PM
To: Sarah O'Brien; Kamran Mumtaz; Gina Antonini
Subject: RE: Tripp police report

Copy that. I've made that point to media before. Just because a threat isn't 'credible' (thankfully!) doesn't mean a threat wasn't brought to our attention. We'll wait to hear back from Jeff/Sean, and then we can go back out to Dana/others, as appropriate.

From: Sarah O'Brien
Sent: Wednesday, August 1, 2018 12:48 PM
To: Kamran Mumtaz <kmumtaz@tesla.com>; Gina Antonini <gantonini@tesla.com>
Cc: Dave Arnold <dwarnold@tesla.com>
Subject: Re: Tripp police report

Hey

So I just spoke to Jeff. Sean is going to go through the entire police report to make sure the version of events is what he remembered.

The key point that he thinks media are getting it wrong. If we receive a threat, we of course notify the police. They investigate. The fact that they found the threat was not credible is a good thing.

Also, the point that media only started reporting this until the following day is on them, not on us. They had the intel, they just didn't report on it.

If something is inaccurate in this meme, I think its worthwhile with sensible media like Dana, that we correct stuff that's wrong. I don't think we should correct anything from the police report that's incorrect, unless Sean or Jeff tell us it's totally out of place and then they should speak to Story first.

On Aug 1, 2018, at 12:27 PM, Jeff Jones <jeff.jones@tesla.com> wrote:

I need to circle back with Sean for any inaccuracies. Most of this is about his interaction with Storey County. Will do that now.

From: Sarah O'Brien
Sent: Wednesday, August 1, 2018 12:15:48 PM
To: Dave Arnold; Jeff Jones
Cc: Lynn Miller; Nicholas Gicinto; Todd Maron; Aarti Reddy; Kamran Mumtaz; Gina Antonini
Subject: Re: Tripp police report

And here's the police report:

<https://www.secwhistleblowerattorney.net/tesla-related-police-reports/>

On Aug 1, 2018, at 12:11 PM, Sarah O'Brien <sobrien@tesla.com> wrote:

+ Jeff as it would be good to know the exact turn of events with this so we can debunk where needed.

On Aug 1, 2018, at 12:10 PM, Dave Arnold
<dwarnold@tesla.com> wrote:

Haven't finished reading, but this doesn't seem
good: <https://www.bloomberg.com/news/articles/2018-08-01/tesla-s-phantom-shooter-the-strange-story-of-a-debunked-threat>

From: Dave Arnold
Sent: Wednesday, August 1, 2018 10:29 AM
To: Lynn Miller <lymiller@tesla.com>
Cc: Nicholas Gicinto <nick.gicinto@tesla.com>; Todd Maron
<todd@tesla.com>; Aarti Reddy <aareddy@tesla.com>; Sarah O'Brien
<sobrien@tesla.com>; Kamran Mumtaz <kmumtaz@tesla.com>; Gina
Antonini <gantonini@tesla.com>
Subject: RE: Tripp police report

More detail from Dana:

Storey County Sheriff went to gigafactory and met with Tesla head of security, Shawn Gourthro, outside of the main lobby; Gourthro gave out a "Be on the lookout" flyer with a picture of Tripp, and said Tesla had gotten a call from a female friend of Tripp's at Las Vegas call center

Then the cops went looking for Tripp, Gouthro was calling the cops and saying he was at a Safeway. The cops finally met with Tripp at a casino.

"Based upon our interview with him, Chief Dosen and I concluded that Tripp was not armed; did not likely have access to firearms; and did not present a threat at that time. Chief Dosen notified our dispatch and Gourthro that the active shooter threat was not viable at that time."

Later, on June 25, they interviewed the Tesla call center employee. "According to information received through the Tesla Call Center, during the call they placed the caller on hold and goggled a news story about Tesla and Tripp. When she returned to the original caller she asked the individual if the caller was calling about subject Tripp. Due to the public knowledge being sent out regarding subject Tripp's termination the caller who stated he was a friend of Tripp's was concerned for the safety of the people working at Tesla due to Tripp's volatility. The caller stated that he had never heard Tripp directly make any threats regarding the Tesla Gigafactory."

From: Lynn Miller
Sent: Wednesday, August 1, 2018 10:28 AM
To: Dave Arnold <dwarnold@tesla.com>
Cc: Nicholas Gicinto <nick.gicinto@tesla.com>; Todd Maron <todd@tesla.com>; Aarti Reddy <aareddy@tesla.com>; Sarah O'Brien <sobrien@tesla.com>; Kamran Mumtaz <kmumtaz@tesla.com>; Gina Antonini <gantonini@tesla.com>
Subject: Re: Tripp police report

I have not.

On Aug 1, 2018, at 10:19 AM, Dave Arnold <dwarnold@tesla.com> wrote:

We're not going to comment, anyway, but FYI. Has anyone seen this full police report that she's referring to?

From: Dana Hull (BLOOMBERG/ NEWSROOM:)
<dhull12@bloomberg.net>
Sent: Wednesday, August 1, 2018 10:17 AM
To: Dave Arnold <dwarnold@tesla.com>
Subject: Re: Tripp police report

I can't send it to you. I can talk by phone and tell you what it says.

Dana Hull
Tesla/SpaceX
dhull12@bloomberg.net
SF office: 415-617-7231
@danahull

From: dwarnold@tesla.com At: 08/01/18 10:14:11
To: [DANA_HULL \(BLOOMBERG/NEWSROOM: \)](mailto:DANA_HULL (BLOOMBERG/NEWSROOM:))
Subject: Re: Tripp police report

Can you send it to me so I can look?

From: Dana Hull (BLOOMBERG/ NEWSROOM:)
<dhull12@bloomberg.net>
Sent: Wednesday, August 1, 2018 10:12:35 AM
To: Dave Arnold
Subject: Tripp police report

Hi Dave,

We have the full police report from Storey County on Martin Tripp. Does Tesla want to comment? It's 10 pages and very detailed.

What's weird is that police were scrambling in response to this tip of a potential threat on June 20th, but ultimately concluded that "Tripp was not armed; did not likely have access to firearms; and did not present a threat at that time." There are also inconsistencies: first Tesla said the woman friend of Tripp's called into the call center, but later when cops interviewed the call center the tipster was male.

June 21st, a day later, is when some media outlets reported that this tip had come in-- even though the day before the police were like this is not actually a big deal.

Dana Hull
Tesla/SpaceX
dhull12@bloomberg.net
SF office: 415-617-7231
@danahull

From: Elon Musk
Sent: Tuesday, August 21, 2018 4:02 AM
To: Juleanna Glover
Cc: Kimbal Musk; Dave Arnold
Subject: Re: WSJ Story on Combating Tesla Critica

Will Tweet as I wish and suffer the consequences. So it goes.

I just deleted my Instagram. Weak sauce.

On Aug 21, 2018, at 12:59 AM, Juleanna Glover <juleanna@ridgelywalsh.com> wrote:

We can definitely lower the decibels on media coverage though to get that to happen you would have to stop changing the world ([sotto voce] and maintain current tone of post 8/13 tweets for a while).

□

RidgelyWalsh.com

202.288.2076

On Aug 21, 2018, at 4:10 PM, Elon Musk <erm@tesla.com> wrote:

Don't they have something else to write about? It is so tiresome to see myself in the news!

On Aug 19, 2018, at 8:09 PM, Juleanna Glover <juleanna@ridgelywalsh.com> wrote:

The Times has no plans to report on Epstein rumors. They do however plan to do a piece for Tuesday that will be a survey of Tesla's finances. They don't expect to have any new news here, but it will be Neal calling around to analysts, w Gelles co-reporting. They also seem to be

contemplating a large feature for Sunday where they will try to talk to everyone in Elon's orbit - TBD story thesis at this point.

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On Aug 20, 2018, at 3:53 AM, Elon Musk <erm@tesla.com> wrote:

Kimbal, it was David Gelles at NYT, right?

Alan Fleischmann may know more.

On Aug 19, 2018, at 11:29 AM, Juleanna Glover <juleanna@ridgelywalsh.com> wrote:

Which reporter relayed that? We can ensure it is run down (without a direct quote from you).

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On Aug 20, 2018, at 3:24 AM, Elon Musk <erm@tesla.com> wrote:

That's good.

Seriously.

Most amazing is that Jeffrey Epstein, one of the worst people on Earth, actually told NYT that he was working with Tesla and me on the take-private. And, under that guise, confided in them "concerns" that he had about me. That was incredibly creepy and diabolical.

On Aug 19, 2018, at 11:18 AM, Juleanna Glover <juleanna@ridgelywalsh.com> wrote:

Matt Murray just called me. He says story is not running tomorrow so we have some time. He may let portions of the email note Elon sent be used in the story and he rightly points out that this note goes far in addressing the accusations. He has asked the reporting team to be punctilious and careful here. Was a good faith call and I am sure if this email below wasn't a solid smart answer, he would steer away from using the note. Downside if of course the Black Cube nonsense will get a mention in the piece if only because it's got a E response. Maybe we can add that Black Cube accusation is sign of an "on obvious overreach in a pitch by the shorts. Surprising that they didn't add we have Al Capone in charge of security and Rose Mary Woods handling records retention."

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On Aug 19, 2018, at 7:26 AM, Elon Musk <erm@tesla.com> wrote:

My apologies, I meant to include Dave Arnold, from Tesla comms. Sorry for the double email.

On Aug 18, 2018, at 12:08 PM, Elon Musk <erm@tesla.com> wrote:

This is pretty weird, if true, and I am surprised that such an article would pass the WSJ standard for good journalism.

As far as "silencing critics" is concerned, I am obviously doing a terrible job. Have you read the news lately? Seriously.

Regarding "Montana Skeptic", I was surprised to read on Twitter that he is supposedly the Chief Investment Officer of Stewart Rahr (and formerly represented Enron on the bad side). This sounded very unlikely, as Stewart has purchased five Tesla's over the years. I texted Stewart asking if he knew his CIO was obsessively trashing Tesla via a pseudonym. He was shocked to

learn this and asked the guy to stop, as people would assume the view held by his investment office CIO is the view held by Stewart, which is not true.

Same thing with VW. People on Twitter said a VW guy was trashing Tesla under a fake name, so I sent an email to Herbert Diess asking if this was true. They would definitely be playing with fire, given that they are still paying the fine from their last emissions cheating scandal. Diess replied saying it was the guy's brother. That's pretty much it. I don't know if he actually stopped or not. Don't care. Source credibility is ... low.

Per the attached email thread, no one has even heard of Black Cube (what Bond movie did they steal that name from!?) or the kid.

As far as Tripp is concerned, that guy stole gigabytes of Tesla data, changed the data to make it sound terrible (fortunately, to a ridiculous degree) and posted it online. At one point, he claimed we had more scrapped parts than the total output of our Gigafactory, which is physically impossible.

Tripp broke a dozen or more laws and caused great harm to the citizens of Nevada. Tesla legal has met with the Nevada Attorney General's office and my understanding is that they are likely to move forward with a criminal case. The facts are unequivocal.

By the way, it is odd that a fairly recent former Attorney General of Nevada, George Chanos, is Jim Chanos's cousin and self-described best friend. What are the odds of that?? Jim Chanos, as you know, is a prominent short seller of Tesla stock and has literally said our company is worth \$0. I'm told that George Chanos is influential with current AG Lexalt. Hopefully, this is not true.

What are we supposed to do here? Advice would be much appreciated.

Thanks,

Elon

Begin forwarded message:

From: Jared Birchall
Date: August 18, 2018 at 10:23:57 AM PDT
To: Elon Musk
Cc: Dave Arnold, Jeff Jones, Sam Teller, Sarah O'Brien, Todd Maron
Subject: Re: WSJ Story on Combating Tesla Critica

On the personal side we have never had a relationship, direct or indirect, with Black Cube. Nor have we ever attempted to communicate with or approach David Deuchar.

On Sat, Aug 18, 2018 at 10:03 AM Elon Musk wrote:

I've never even heard of Black Cube or David Deuchar. This is incredibly bizarre.

On Aug 18, 2018, at 8:09 AM, Sarah O'Brien <sobrien@tesla.com> wrote:

Hi Elon,

The WSJ is preparing to publish an article, likely on Monday morning, examining various actions taken by you and Tesla to combat critics of the company, including short sellers and former employees (Tripp and the latest whistleblower). The article will make the point that we try to go to great lengths to try to stop critics.

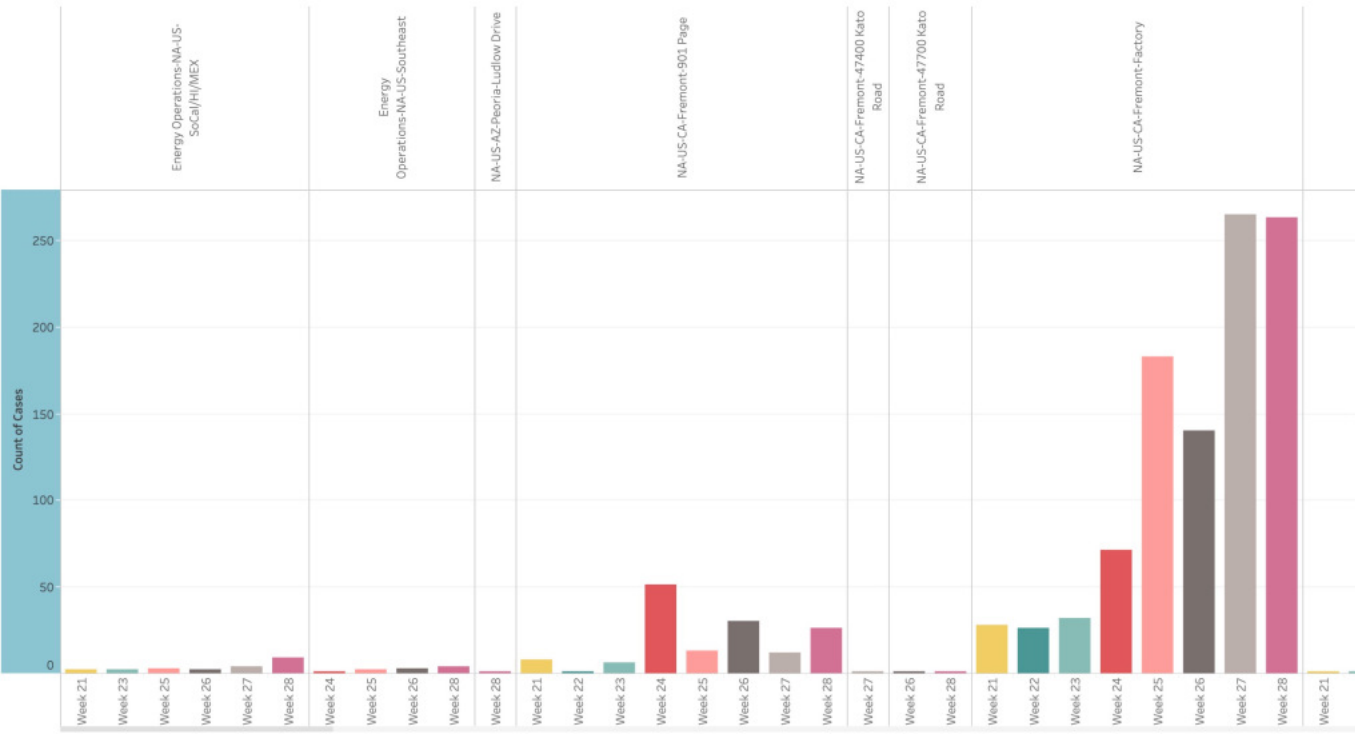
The article will mention Tripp and Karl Hansen's claims, and our response, and will also discuss how you contacted Fossi's employer, as well as Herbert Diess re: Skabooshka. The article will also say we've hired an Israeli investigative firm called Black Cube, and that in 2016 you (or someone claiming to be you) allegedly called a Rutgers student named David Deuchar to tell him you didn't like his articles on Tesla. Deuchar claims that two investigators then showed up at his door.

We're pushing back hard on all of this on background and using statements we've already made publicly, but we're not familiar with the claims re: Black Cube or David Deuchar – let us know if you have any insight into those.





Exposures by Week (No Exposure Date Cases Exculded)



Response by Circumstance

Circumstances	Not Specified	Employee(s)	3rd Party Contractor(s)	Contingent / Temporary(s)	Other(s)	Grand Total
Direct Contact at Work	0	2	1	1	1	2
Direct Contact Away From Work	0	4	0	0	0	4
Not Specified	0	7	0	0	0	8
Symptomatic	0	4	0	0	0	4
Grand Total	0	1,7	1	1	1	1,9

Person Status

Test Status	Not Specified	Employee(s)	3rd Party Contractor(s)	Contingent / Temporary(s)	Other(s)	Grand Total
Negative	0	2	1	1	1	2
Not Specified	0	9	0	1	0	1,0
Not Tested	0	2	0	0	0	2
Pending	0	1	0	0	0	1
Positive	0	1	0	0	0	1
Grand Total	0	1,7	1	1	1	1,9

Person Status by Site

